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# SCIENTIFIC SURVEY

OF

# Porto Rico and the Virgin Islands

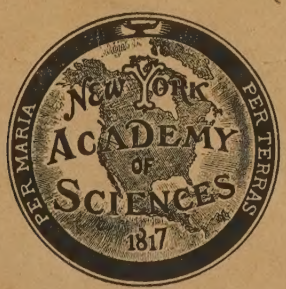
## VOLUME VIII—Part 1

**Botany of Porto Rico and the Virgin Islands**

**Mycology**

*Fred J. Seaver and Carlos E. Chardon*

*With contributions by Rafael A. Toro; F. D. Kern and H. H. Whetzel; and L. O. Overholts*




NEW YORK:
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[Issued December 29, 1926]

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# PREFACE.

The term mycology is here used in the broad sense including not alone the study of fungi, but also the slime-moulds and bacteria. During Spanish occupation of Porto Rico, little attention was given to mycology, the earliest recorded collection being that of Carl Schwanecke made during his residence in Porto Rico, 1847–1850. The fungi of this collection, consisting of seventeen species, were determined and published by J. F. Klotzsch. A second and larger collection was made by P. Sintenis, 1884–1887, the determinations being made by J. Bresadola, P. Hennings and P. Magnus.

Since annexation by the United States the work has been greatly extended through the operations of the Insular Department of Agriculture and by a number of botanists who have visited the island for longer or shorter periods. Among these are A. A. Heller and Mrs. Heller, during the early part of 1900; G. P. Clinton in 1904; and E. W. D. Holway in 1910. Numerous collections of fungi have also been made by Dr. and Mrs. N. L. Britton and other collectors from the staff of The New York Botanical Garden at intervals from 1906 until the present time.

Bruce Fink of Miami University, Ohio, visited the island in 1915 primarily for the collection and study of lichens but brought back a goodly number of fungi. The same year H. H. Whetzel and E. W. Olive spent several weeks in Porto Rico devoting most of their time to researches on the rusts. Their collections have been studied and reported on by J. C. Arthur.

Probably the largest single collection of fungi was that obtained by F. L. Stevens during the years of his residence as Dean of the College of Agriculture at Mayaguez. His collection of rusts was also studied by J. C. Arthur and reported by him. Other groups of fungi have been studied by Professor F. L. Stevens and his collaborators at the University of Illinois and reported on at various times.

In 1923, Dr. Seaver, at the request of the Porto Rican government, spent several weeks in company with Dr. and Mrs. N. L. Britton, exploring Porto Rico and the Virgin Islands. Mr. Chardon,

then connected with the Insular Experiment Station at Rio Piedras, collaborated with us during our stay in Porto Rico. More than a thousand collections of fungi were made including many additional species for the region.

In 1924 H. H. Whetzel of Cornell University made a second trip to Porto Rico, this time accompanied by F. D. Kern of The Pennsylvania State College to continue work on plant rusts. On most of their excursions they were accompanied by Rafael A. Toro of the Experiment Station at Rio Piedras. This expedition again resulted in adding much new material to the store already accumulated. Part of the results of this work has been reported in preliminary papers and the remainder is incorporated in the present work.

Local students, especially those connected with the Department of Agriculture, have added their contributions, so that the fungi of Porto Rico are now probably better known than those of any equal area in the American tropics. Our knowledge of the plant rusts is particularly complete. But notwithstanding this, some groups of the fungi have scarcely been investigated and are still in need of intensive study.

While the fungi of Porto Rico have been rather carefully studied, the Virgin Islands were, so far as we are aware, unexplored by American mycologists until our visit in 1924, although a few species had been reported by European students. For this reason the two weeks spent on the larger islands, St. Thomas and St. Croix were full of interest. About fifty per cent of the fungi collected were new to the islands and a fair number new to science. The results of this work have been reported in preliminary papers and incorporated in the present work with detailed citations.

In 1918, J. A. Stevenson, at that time Pathologist at the Insular Experiment Station, published "A check list of Porto Rican fungi and a host index." This was a very complete summary of our knowledge of the fungi of Porto Rico up to that time, and has been invaluable to us in the preparation of the present catalogue.

For the determination of hosts we are indebted to Dr. N. L. Britton and Mr. Percy Wilson and for bibliographical aid to Dr. J. H. Barnhart.

# DESCRIPTIVE FLORA.

## Phylum 4. THALLOPHYTA.

Plants not differentiated into leaf and stem, one to many-celled, with or without chlorophyl, reproducing by direct cell-division (fission) or by means of special reproductive bodies known as spores which may be formed either sexually or asexually.

| | | |
|---|---|---|
| Plant tissues partially or entirely chlorophylless. | | |
| Thallus entirely chlorophylless. | | |
| Vegetative stage devoid of cell-wall. | Class 1. | MYXOMYCETES. |
| Vegetative stage possessing cell-wall. | | |
| Reproducing by fission, without mycelia structure. | Class 2. | SCHIZOMYCETES. |
| Reproducing by means of spores, usually possessing mycelium. | Class 3. | FUNGI. |
| Thallus consisting of chlorophylless (fungous) tissue and chlorophyl-bearing (algal) tissue. | Class 4. | LICHENES. |
| Plant tissues chlorophyl-bearing. | Class 5. | ALGAE. |

## Class 1. MYXOMYCETES.*

The Myxomycetes, commonly known as slime-moulds, comprise a large group of living organisms of doubtful affinity. Some include them with the animal kingdom, others with the vegetable. While the vegetative stage is animal-like, consisting of living, moving protoplasm, the fruiting stage is fungus-like so that the group is often treated with the fungi. The most of the forms are saprophytic and of no known economic importance while a few are known to be the cause of serious diseases of the higher plants.

### Sub-class PHYTOMYXINAE.

1. **PLASMODIOPHORA** Woronin, Jahrb. Wiss. Bot. **11**: 548. 1878.

**Plasmodiophora vascularum** Matz, Jour. Dept. Agr. Porto Rico **4**: 45. 1920.

On *Saccharum officinarum* L., Porto Rico:—Barbados. According to M. T. Cook, causing much injury to this most important host.

### Sub-class EXOSPOREAE.

### Family 1. CERATIOMYXACEAE.

1. **CERATIOMYXA** Schröt. in E. & P. Nat. Pfl. $1^1$: 16. 1897.

1. **Ceratiomyxa fruticulosa** (Muell.) Macbr. N. Am. Slime-moulds ed. 1. 18. 1899.

*Byssus fruticulosa* Muell. Fl. Dan. *pl. 718, f. 2.* 1777.

On rotten wood, Porto Rico:—probably world wide.

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* Based on determinations made by Dr. W. C. Sturgis for J. A. Stevenson and by Professor T. H. Macbride and Mr. Robert Hagelstein for the present authors.

Sub-class **MYXOGASTRES.**

Spore mass black or violaceous, rarely ferruginous.
Capillitium present and well-developed, thread-like; sporangia calcareous more or less throughout. Order 1. PHYSARALES.
Capillitium present and usually arising from a well-developed columella; sporangia not calcareous except in a single genus; and then confined to the columella. Order 2. STEMONITALES.
Spore mass never black, usually some shade of brown or yellow, rarely purplish or rosy.
Capillitium none or very poorly developed; spores some shade of brown, rarely purple. Order 3. CRIBRARIALES.
Capillitium present and usually well-developed.
Capillitium by outward interweaving making up the aethalial wall; spores pale, ashen. Order 4. LYCOGALALES.
Capillitium made up of more or less distinctly sculptured threads; spores commonly yellow. Order 5. TRICHIALES.

Order 1. **PHYSARALES.**

Sporangia often calcareous throughout; capillitium intricate. Fam. 1. PHYSARACEAE.
Sporangia with calcareous deposits limited to peridium or sometimes the stipe; capillitium simple. Fam. 2. DIDYMIACEAE.

Family 1. **PHYSARACEAE.**

1. **CRATERIUM** Trentepohl in Roth, Catalecta **1:** 224. 1797.

1. **Craterium aureum** (Schum.) Rost. Sluz. Monog. 124. 1875.

*Trichia aurea* Schum. Enum. Pl. Saell. **2:** 208. 1803.

On humus and cane trash, occasionally on living stalks and leaves, Porto Rico:—continental North America; Europe.

2. **Craterium leucocephalum** (Pers.) Ditm.; Sturm, Deutsch Fl. Pilze **1:** 21. 1817.

*Arcyria* (?) *leucocephala* Pers. Syn. Fung. 183. 1801.

On dead leaves and debris, occasionally fruiting on living sugar cane, Porto Rico:—continental North America; Europe.

2. **DIACHEA** Fries, Syst. Orb. Veg. **1:** 143. 1825.

1. **Diachea bulbilloso** (Berk. & Br.) Lister, Mycetozoa ed. 2. 119. 1911.

*Didymium bulbillosum* Berk. & Br. Jour. Linn. Soc. **14:** 84. 1875.

Porto Rico:- widely distributed.

2. **Diachea leucopodia** (Bull.) Rost. Sluz. Monog. 190. 1875.

*Trichia leucopodia* Bull. Herb. Fr. *pl. 502, f. 2.* 1791.

On dead grass and leaves. Reported on *Pitcairnia angustifolia* (Sw.) Redoute, Porto Rico:—continental North America; Europe.

3. **DIDERMA** Pers. Neues Mag. Bot. **1:** 89. 1794.

1. **Diderma effusum** (Schw.) Morg. Jour. Cin. Soc. **16:** 155. 1894.

*Physarum effusum* Schw. Trans. Am. Phil. Soc. II. **4:** 257. 1832.

On dead leaves of *Pandanus utilis* Bory, Porto Rico:—continental North America.

2. **Diderma hemisphericum** (Bull.) Horne, Fl. Danica **33:** 13. 1829.

*Reticularia hemispherica* Bull. Herb. Fr. *pl. 446.* 1789.

On dead leaves, Porto Rico:—widely distributed,

3. **Diderma spumarioides** Fries, Syst. Myc. **3:** 104. 1829.

On dead leaves and rotten wood, Porto Rico:—continental North America; Europe.

4. **FULIGO** Haller, Hist. Helv. **3:** 110. 1768.

1. **Fuligo septica** (L.) Weber; Wigg. Pr. Fl. Holsat. 112. 1780.

*Mucor septicus* L. Sp. Pl. ed 2. 1656. 1753.

On dead cane leaves, banana debris and rotten wood, Porto Rico:—probably world wide in distribution.

This widely distributed species has many forms and phases as stated by Macbride in his latest edition of the North American Slime-moulds. Five forms are recognized by him as follows: *F. ovata, F. rufa, F. laevis, F. flava* and *F. violacea.* Whether one or all of these forms occur in Porto Rico has not been determined.

5. **PHYSARUM** Pers. Ann. Bot. Usteri **15:** 5. 1795.

1. **Physarum bitectum** Lister, Mycetozoa ed. 2. 78. 1891.

On dead leaves of *Clusia,* Porto Rico:—continental North America.

According to Macbride this is probably a variety of *Physarum sinuosum* (Bull.) Weinm.

2. **Physarum bogoriense** Racib. Hedwigia **37:** 52. 1898.

Porto Rico:—widely distributed.

3. **Physarum cinereum** (Batsch) Pers. in Neues Mag. Bot. **1:** 88. 1794.

*Lycoperdon cinereum* Batsch, Elench. Fung. **1:** 155, 1783.

Fruiting on living leaves of *Lactuca sativa* L., *Phaseolus vulgaris* L., *Saccharum officinarum* L., *Vigna unguiculata* (L.) Walp. and other hosts, Porto Rico:—continental North America; Europe.

4. **Physarum compressum** Albert. & Schw. Consp. Fung. 97. 1805.

On sugar cane debris, Porto Rico:—continental North America; Europe.

5. **Physarum didermoides** (Pers.) Rost. Sluz. Monog. 97. 1875.

*Spumaria* (?) *didermoides* Pers. Syn. Fung. XXIX. 1801.

On rotten wood, Porto Rico:—probably world wide in distribution.

6. **Physarum melleum** (Berk. & Br.) Massee, Monog. 278. 1892.

*Didymium melleum* Berk. & Br. Jour. Linn. Soc. **14:** 83. 1873.

On dead leaves, Porto Rico:—continental South America; Europe; Japan. Macbride states tropical islands round the world.

7. **Physarum nodulosum** Cooke & Balf. in Rav. Fungi Am. *479.* 1881.

On rotten sacking and also on the living leaves of *Saccharum officinarum,* L. Porto Rico:—continental North America; Europe.

This has been previously reported under the name of *Physarum pusillum* (Berk. & Curt.) Lister which Macbride in his latest edition of the North American Slime-moulds considers a synonym of the above.

8. **Physarum tenerum** Rex, Proc. Acad. Phila. **1890:** 192.

Porto Rico:—widely distributed.

9. **Physarum viride** (Bull.) Pers. Ann. Bot. Usteri **15:** 6. 1795.

*Sphaerocarpus viridis* Bull. Herb. Fr. *pl. 407, f. 1.* 1788.

On rotten wood, Porto Rico:—widely distributed.

10. **Physarum wingatense** Macbr. N. Am. Slime-moulds ed. 2. 72. 1922.

On rotten wood, Porto Rico:—continental North America.

This has been reported from Porto Rico under the name of *Physarum columbinum* (Rost.) Sturgis with *Tilmadoche compacta* (Wing.) Macbr. as a synonym. Macbride in his latest edition of "North American Slime-moulds" considers the former determination doubtful and since the latter name would become untenable in the genus *Physarum* proposed the name listed above.

## Family 2. **DIDYMIACEAE.**

### 1. **DIDYMIUM** Schrad. Nov. Gen. Pl. 20. 1797.

1. **Didymium nigripes** (Link) Fries, Syst. Myc. **3:** 119. 1829.

*Physarum nigripes* Link, Ges. Nat. Freunde Berlin Mag. **3:** 27. 1809.

Fruiting on living leaves of *Commelina longicaulis* Jacq. Host previously reported as *Commelina nudiflora* L., Porto Rico:—continental North America; Europe.

2. **Didymium squamulosum** (Albert. & Schw.) Fries, Syst. Myc. **3:** 118. 1829.

*Diderma squamulosum* Albert. & Schw. Consp. Fung. 88. 1805.

On dead leaves, Porto Rico:—continental North America.

## Order 2. **STEMONITALES.**

| | |
|---|---|
| Columella branched throughout. | Fam. 1. STEMONITACEAE. |
| Columella branched only from the top. | Fam. 2. LAMPRODERMACEAE. |

## Family 1. **STEMONITACEAE.**

### 1. **COMATRICHA** Preuss, Linnaea **24:** 140. 1851.

1. **Comatricha longa** Peck, Ann. Rep. N. Y. State Mus. **43:** 24. 1890.

On dead wood, Porto Rico:—continental North America.

2. **Comatricha typhoides** (Bull.) Rost.; Lister, Mycetozoa ed. 2. 157. 1911.

*Trichia typhoides* Bull. Herb. Fr. *pl. 477, f. 2.* 1791.

On dead wood, Porto Rico:—continental North America; Europe.
One of the commonest North American species.

### 2. **STEMONITIS** (Gleditsch) Weber; Wigg. Pr. Fl. Holsat. 110. 1780.

1. **Stemonitis fusca** Roth, Mag. Bot. **2:** 26. 1787.

On old wood, Porto Rico:—continental North America; Europe.

2. **Stemonitis herbatica** Peck, Ann. Rep. N. Y. State Mus. **26:** 75. 1874.

On rotten wood, Porto Rico:—continental North America; also reported from Europe.

3. **Stemonitis nigrescens** Rex, Proc. Acad. Phila. **1891:** 392. 1891.

On sugar cane trash, Porto Rico:—continental North America.

Reported under the name of *Stemonitis fusca* Roth which Macbride in his North American Slime-moulds regards as a synonym of the above.

4. **Stemonitis splendens** Rost. Sluz. Monog. 195. 1875.

On rotten wood, Porto Rico; St. Thomas:—continental North and South America.

In addition to material previously reported from Porto Rico, an excellent collection was made on the island of St. Thomas and reported in Mycologia **16:** 4. 1924.

## Family 2. **LAMPRODERMACEAE.**

### 1. **LAMPRODERMA** Rost. Versuch. Mycet. 7. 1873.

1. **Lamproderma arcyrionema** Rost. Sluz. Monog. 208. 1885.

On mossy log, Porto Rico:—widely distributed.

## Order 3. **CRIBRARIALES.**

| | |
|---|---|
| Fructification of distinct and separate sporangia, the walls more or less reticulately perforate especially above. | Fam. 1. Cribrariaceae. |
| Fructification aethalioid. | |
| The sporangia more or less tubular, often prismatic by mutual pressure, opening by rupture at the apex, the lateral walls entire. | Fam. 2. Tubiferaceae. |
| The sporangia not well defined, their walls more or less perforate and frayed, forming a pseudo-capillitium. | Fam. 3. Reticulariaceae. |

## Family 1. **CRIBRARIACEAE.**

### 1. **CRIBRARIA** Pers. Neues Mag. Bot. **1:** 91. 1794.

1. **Cribraria microcarpa** (Schrad.) Pers. Syn. Fung. 190. 1801.

*Dictydium microcarpum* Schrad. Nova Gen. Pl. 13. 1797.

On wood, Porto Rico:—continental North America; Europe.

### 2. **DICTYDIUM** Schrad. Nov. Gen. Pl. 11. 1797.

1. **Dictydium cancellatum** (Batsch) Macbr. N. Am. Slime-moulds ed. 1. 172. 1899.

*Mucor cancellatus* Batsch, Elench. Fung. **3:** 135. 1789.

On dead sugar cane stalks and leaves, Porto Rico:—continental North America; Europe. Probably widely distributed.

## Family 2. **TUBIFERACEAE.**

### 1. **TUBIFERA** Gmel. Syst. Nat. **2:** 1472. 1791.

1. **Tubifera ferruginosa** (Batsch) Macbr. N. Am. Slime-moulds ed. 1. 156. 1899.

*Stemonitis ferruginosa* Batsch, Elench. Fung. **2:** 261. 1786.

On rotten wood, Porto Rico:—continental North America; Europe. Macbride states, "apparently more common north than south."

Family 3. **RETICULARIACEAE.**

1. **RETICULARIA** Bull. Herb. Fr. *pl. 446.* 1789.

1. **Reticularia Lycoperdon** Bull. Herb. Fr. *pl. 446, f. 4.* 1789.

On old wood, Porto Rico:—continental North America; Europe.

Order 4. **LYCOGALALES.**

Family 1. **LYCOGALACEAE.**

1. **LYCOGALA** (Micheli) Pers. Neues Mag. Bot. **1:** 87. 1794.

1. **Lycogala epidendrum** (L.) Fries, Syst. Myc. **3:** 80. 1829.

*Lycoperdon epidendrum* L. Sp. Pl. ed 1. 1184. 1753.

On rotten wood and sugar cane trash, Porto Rico:—widely distributed. Probably world wide.

Order 5. **TRICHIALES.**

Capillitium a distinct net, usually attached below to the sporangial wall; sculpturing various, not continuous spiral bands. Fam. 1. ARCYRIACEAE.

Capillitium not a distinct net, threads typically free or forming a loose net attached below; sculpturing consisting of spiral bands or scattered rings. Fam. 2. TRICHIACEAE.

Family 1. **ARCYRIACEAE.**

1. **ARCYRIA** Weber; Wigg. Pr. Fl. Holsat. 109. 1780.

1. **Arcyria cinerea** (Bull.) Pers. Syn. Fung. 184. 1801.

*Trichia cinerea* Bull. Herb. Fr. *pl. 477, f. 3.* 1789.

On rotten wood and sugar cane trash, Porto Rico:—continental North America; Europe.

2. **Arcyria denudata** (L.) Macbr. N. Am. Slime-moulds ed. 1. 195. 1899.

*Clathrus denudatus* L. Sp. Pl. ed. 1. 1179. 1753.

On rotten wood and sugar cane trash, Porto Rico:—continental North America; Europe.

3. **Arcyria incarnata** Pers. Obs. Myc. **1:** 58. 1796.

*Stemonitis incarnata* Pers.; Gmel. Syst. Nat. **2:** 1467. 1796.

On rotten wood, Porto Rico:—continental North America; Europe.

4. **Arcyria punicea** Pers. Neues Mag. Bot. **1:** 90. 1794.

Reported from the Schwanecke collection, Porto Rico:—continental North America; Europe.

Macbride in "North American Slime-moulds" regards this as synonymous with *A. denudata.*

Family 2. **TRICHIACEAE.**

1. **HEMITRICHIA** Rost. Versuch Mycet. 14. 1873.

1. **Hemitrichia clavata** (Pers.) Rost. Sluz. Monog. 264. 1875.

*Trichia clavata* Pers. Neues Bot. Mag. **1:** 90. 1794.

On rotten wood, Porto Rico:—continental North America; Europe. Widely distributed.

2. **Hemitrichia serpula** (Scop.) Rost. Sluz. Monog. 266. 1875.

*Mucor serpula* Scop. Fl. Carn. **2**: 493. 1772.

On decaying stems, Porto Rico:—continental North America; Europe.

3. **Hemitrichia vesparium** (Batsch) Macbr. N. Am. Slime-moulds ed. 1. 203. 1899.

*Lycoperdon vesparium* Batsch, Elench. Fung. **2**: 253. 1786.

On rotten wood, Porto Rico:—continental North America; Europe.

## Class 2. SCHIZOMYCETES.

This group of microorganisms commonly known as bacteria is doubtless represented by many species in Porto Rico as elsewhere. No special attempt has been made to study them taxonomically and the few listed here are those which have been found to be the cause of diseases of the higher plants or have been encountered in connection with the work in plant pathology.

| | |
|---|---|
| Plants not filamentous. | |
| Cells when free globular. | Fam. 1. COCCACEAE. |
| Cells elongated or rod-like. | Fam. 2. BACTERIACEAE. |
| Plants filamentous. | Fam. 3. ACTINOMYCETACEAE. |

### Family 1. COCCACEAE.

1. **MICROCOCCUS** Cohn, Beitr. Biol. Pfl. $1^2$: 151. 1875.

1. **Micrococcus nigrofaciens** Northrup, Mich. Agr. Exp. Sta. Tech. Bull. **18**: 12. 1914.

Reported as causing disease of various phases of *Phyllophaga* spp., Porto Rico:—continental North America.

### Family 2. BACTERIACEAE.

1. **BACILLUS** Cohn, Beitr. Biol. Pfl. $1^2$: 174. 1872.

1. **Bacillus carotovorous** Jones, Centralb. Bakt. Parasit. Infect. **7**: 12. 1901.

Occurring on and producing soft rot of carrots, cabbages, celery, and other vegetables, Porto Rico:—continental North America.

2. **Bacillus campestris** Pammel, Iowa Agr. Exp. Sta. Bull. **27**: 130. 1895.

On *Brassica oleracea* L., Porto Rico:—continental North America.

3. **Bacillus mesentericus** [fuscus] (Flügge) Lehm. & Neum. Atlas Bakt. 300. 1896.

*Bacillus mesentericus fuscus* Flügge, Die Mikroorganismen. ed 2. 321. 1886.

Reported as causing "ropy" bread, Porto Rico:—widely distributed.

4. **Bacillus prodigiosus** (Ehr.) Flügge, Die Mikroorganismen ed. 2. 284. 1886.

Reported as causing contamination in culture plates, Porto Rico:—widely distributed.

5. **Bacillus subtilis** (Ehr.) Cohn. Beitr. Biol. Pfl. $1^2$: 175. 1875.

*Vibrio subtilis* Ehr. Infus. 80. 1838.

Reported as common on poured culture plates, Porto Rico:—widely distributed.

6. **Bacillus vascularum** Cobb, Dis. Sugar Cane 1. 1893.

Occasionally found as the cause of a disease of sugar cane, Porto Rico:—New South Wales, Queensland, Figi Islands. Mauritius, Java, Borneo, New Guinea, Brazil.

2. **BACTERIUM** Ehr. Symb. Phys. 8. 1828.

1. **Bacterium abortus** Bang. Zeit. Thier. **1897**: 241.

Causing abortion in cattle, Porto Rico:—continental America. Reported as a *Bacillus*.

2. **Bacterium Phaseoli** Er. Smith, Proc. Am. Assoc. Adv. Sci. **46**: 288. 1898.

On *Phaseolus vulgaris* L., Porto Rico:—continental North America. Causing a serious disease of the leaves and pods.

3. **Bacterium Solanacearum** Er. Smith, U. S. Dept. Agr. Div. Veg. Phys. & Path. Bull. **12**: 5. 1896.

On *Lycopersicon Lycopersicon* (L.) Karst., *Nicotiana Tabacum* L., *Solanum Melongena* L., *Solanum tuberosum* L., Porto Rico:—continental North America. Probably widely distributed.

A wilt disease of *Helianthus annuus* L. is thought to be caused by this organism.

3. **PSEUDOMONAS** Migula, Arb. Bact. Inst. Karlsruhe **1**: 237. 1894.

1. **Pseudomonas radicicola** (Beyerinck) Moore, U. S. Dept. Agr. Bur. Pl. Ind. **71**: 27. 1905.

*Bacillus radicicola* Beyerinck, Bot. Zeit. **46**: 726. 1888.

Occurring as a parasite on the roots of leguminose plants and giving rise to root-tubercles. Although parasitic on the host plant the parasite appears to be beneficial and the two thus live together in a symbiotic relationship. Through the ability of the parasite to fix nitrogen the leguminose hosts are used as soil enrichers.

2. **Pseudomonas tumefaciens** (Smith & Townsend) Stevens, Fungi Pl. Dis. 35. 1913.

*Bacterium tumefaciens* Smith & Townsend, Science II. **25**: 672. 1907.

The organism of the crown gall commonly known as "plant cancer" because of its resemblance to the animal cancer. The organism is here reported on the strength of galls found on rose bushes near Arecibo during the recent collecting trip of the senior writer. No attempt was made to isolate the organism.

## Family 3. **ACTINOMYCETACEAE.**

1. **ACTINOMYCES** Harz, Jahresb. München Central-Thier. 1878.

1. **Actinomyces scabies** (Thaxt.) Gussow, Science II. **39**: 433. 1914.

*Oospora scabies* Thaxt. Conn. Agr. Exp. Sta. Rep. **1891**: 159.

Reported from Porto Rico by Cook under the name of *Actinomyces chromogenus* which is now regarded as a synonym of the above.

## Class 3. **FUNGI.**

### Sub-class 1. **PHYCOMYCETES.**

The Phycomycetes are known as the algal fungi because of their structural resemblance to the algae. Many are aquatic and those which are not require very

moist conditions. Swimming spores are commonly produced by the plants of this group even though they are not strictly aquatic, indicating their aquatic origin. Such forms as the water-moulds, fish-moulds, downy mildews, and black bread-mould are included here.

| | |
|---|---|
| Mycelium wanting or poorly developed; sexual reproduction usually wanting; parasitic on algae, protozoans or rarely on spermatophytes. | Order 1. CHYTRIDIALES. |
| Mycelium well developed; asexual reproduction by aerial conidia or sporangia. Saprophytic, epiphytic or parasitic on other plants. | |
| Parasitic on spermatophytes. | Order 2. PERONOSPORALES. |
| Saprophytic, or parasitic on other fungi. | Order 3. MUCORALES. |
| Parasitic or saprophytic on insects. | Order 4. ENTOMOPHTHORALES. |

## Order 1. CHYTRIDIALES.

The Chytridiales are parasitic fungi of simple structure often consisting of a single cell. They live on other plants and animals such as protozoans, desmids, algae and other fungi. Some also occur as parasites on the stems and leaves of the higher plants.

| | |
|---|---|
| Sporangia produced singly. | Fam. 1. OLPIDIACEAE. |
| Sporangia produced in sori. | Fam. 2. WORONINACEAE. |

### Family 1. OLPIDIACEAE.

1. **OLPIDIUM** A. Braun, Abh. Berl. Akad. **1855**: 75. 1855.

1. **Olpidium Uredinis** (Lagerh.) Fischer; Rab. Krypt-Fl. **1**[4]: 30. 1892.

On *Puccinia levis* (Sacc. & Bizz.) Magn. on *Rytilix granularis* (L.) Skeels, Porto Rico:—Europe.

### Family 2. WORONINACEAE.

1. **WORONINELLA** Racib. Zeit. Pflanzenkr. **8**: 195. 1898.

1. **Woroninella Dolicholi** (Cooke) Syd. Ann. Myc. **12**: 485. 1914.

*Aecidium Dolicholi* Cooke, Grevillea **10**: 127. 1882.

On *Dolicholus reticulatus* (Sw.) Millsp., Porto Rico; St. Croix:—continental North America.

This species was collected rather abundantly on Mt. Eagle, St. Croix where it was found to form gall-like growths on the stems and leaves of the above named species of *Dolicholus*.

## Order 2. PERONOSPORALES.

The Peronosporales represent an order of parasitic fungi including the "white rusts" and "downy mildews." This group includes two of the most destructive parasites known, the "grape mildew" and the "potato blight," the latter often being responsible for the destruction of a large per cent of the potato crop wherever this plant is grown. Both of these species have been reported from Porto Rico.

| | |
|---|---|
| Conidiophores club-shaped, formed under the epidermis of the host; conidia formed in chains in white masses under the epidermis of the host. | Fam. 1. ALBUGINACEAE. |
| Conidiophores formed outside the epidermis of the host; conidia formed singly, never in chains. | Fam. 2. PERONOSPORACEAE. |

## Family 1. **ALBUGINACEAE.**

1. **ALBUGO** (Pers.) S. F. Gray, Nat. Arr. Brit. Pl. **1**: 540. 1821.
*Uredo* § *Albugo* Pers. Syn. Fung. 223. 1801.

1. **Albugo Bliti** (Biv.) Kuntze, Rev. Gen. Pl. **2**: 658. 1891.
*Uredo Bliti* Biv. Stirp. Rar. Silicia **3**: 658. 1891.

On *Amaranthus gracilis* Desf. and *A. viridis* L., *Centrostachys aspera* (L.) Standley [*Achyranthes aspera* L.], Porto Rico; St. Croix:—Guadaloupe; Grenada; continental America: Europe; Asia; Africa.

One collection (Seaver & Chardon *418*) was made on *Centrostachys aspera*. This is apparently a new host for this fungus.

2. **Albugo candida** (Pers.) Kuntze, Rev. Gen. Pl. **2**: 658. 1891.
*Aecidium candidum* Pers. in Gmel. Syst. Nat. **2**: 1473. 1791.

On *Boerhaavea erecta* L., and *Lepidium virginicum* L., Porto Rico; *Brassica integrifolia* (West) O. E. Schulz, St. Croix:—Cuba; Bermuda; continental America; Asia; Africa; Australia; New Zealand.

3. **Albugo Ipomoeae-panduraneae** (Schw.) Swingle, Jour. Myc. **7**: 112. 1892.
*Aecidium Ipomoeae-panduraneae* Schw. Schr. Nat. Ges. Leipzig. **1**: 69. 1822.

On *Ipomoea Batatas* (L.) Lam., *I. Pes-caprae* (L.) Roth., *I. tiliacea* (Willd.) Choisy, *I. aegyptia* L., *Jacquemontia nodiflora* (Desv.) G. Don, *J. pentantha* (Jacq.) G. Don, Porto Rico; *Quamoclit coccinea* (L.) Moench, *Ipomoea Pes-caprae* (L.) Roth., St. Jan.; St. Croix:—Bahamas; Cuba; Trinidad; continental America; Europe; Asia; Africa.

Very commonly found infecting sweet potatoes. On *Ipomoea Pes-caprae* (L.) Roth., a seashore trailing plant, the colonies of sori cause very characteristic malformations of the leaves.

4. **Albugo platensis** (Speg.) Swing. Jour. Myc. **7**: 113. 1892.
*Cystopus platensis* Speg. Rev. Argent. Hist. Nat. **1**: 32. 1891.

On *Boerhaavea erecta* L., *B. coccinea* Mill. [*B. hirsuta* Jacq.], Porto Rico:—Cuba; Bahamas; Guadeloupe; Antigua; Martinique; continental America; Asia; Africa.

5. **Albugo Portulacae** (DC.) Kuntze, Rev. Gen. Pl. **2**: 658. 1891.
*Uredo Portulacae* DC. Fl. Fr. **6**: 88. 1815.

On *Portulaca oleracea* L., Porto Rico:—Trinidad; continental America; Europe; Asia; Africa.

A rare species, known only from two collections from the island.

## Family 2. **PERONOSPORACEAE.**

1. **PSEUDOPERONOSPORA** Rostow. Ann. Inst. Agron. Mosc. **9**: 47. Ja. 1903.—Flora **92**: 422. O 1903.

1. **Pseudoperonospora cubensis** (Berk. & Curt.) Rostow. Ann. Inst. Agron. Mosc. **9**: 47. Ja 1903.—Flora **92**: 422. O 1903.
*Peronospora cubensis* Berk. & Curt. Jour. Linn. Soc. **10**: 363. 1868.
*Peronoplasmopara cubensis* Clinton, Conn. Agr. Exp. Sta. Rep. **28**: 335. 1904.

On *Cucumis Melo* L., *Cucumis sativus* L., *Pepo moschata* (Duch.) Britton [*Cucurbita moschata* Duch.], *Luffa cylindrica* (L.) M. J. Roem., Porto Rico:—Cuba; continental North America.

2. **Pseudoperonospora portoricensis** (Lamkey) comb. nov.

*Peronoplasmopora portoricensis* Lamkey; Stevens, Mycologia **12**: 52. 1920.

On *Melia Azedarach* L., Porto Rico:—endemic.

2. **PHYTOPHTHORA** De Bary, Jour. Roy. Agr. Soc. England II. **12**: 240. 1876.

1. **Phytophthora infestans** (Mont.) De Bary, Jour. Roy. Agr. Soc. Engl. II. **12**: 240. 1876.

*Botrytis infestans* Mont. Mém. Inst. Fr. **1845**: 313. 1845.

On *Solanum tuberosum* L., *Lycopersicon Lycopersicon* (L.) Karst., Porto Rico:—continental America; Europe; Asia; Africa; Australia.

2. **Phytophthora Phaseoli** Thaxt. Bot. Gaz. **14**: 274. 1889.

On *Phaseolus lunatus* L., Porto Rico:—continental America; Europe.

3. **Phytophthora terrestris** Sherb. Phytopathology **7**: 127. 1917.

On *Capsicum annuum* L., *Phaseolus vulgaris* L., *Lycopersicon Lycopersicon* (L.) Karst., Porto Rico:—continental North America.

Note,—In addition to the above, *P. Faberi* Maubl. has recently been reported as cause of bud rot in *Cocos nucifera*.

3. **RHYSOTHECA** G. W. Wilson, Bull. Torrey Club. **34**: 398. 1907.

1. **Rhysotheca viticola** (Berk. & Curt.) G. W. Wilson, Bull. Torrey Club **34**: 407. 1907.

*Botrytis viticola* Berk. & Curt. Jour. Hort. Soc. London **6**: 289. 1851. (hyponym).

*Peronospora viticola* De Bary, Ann. Sci. Nat. IV. **20**: 124. 1863.

Reported on *Vitis* sp., Porto Rico:—coextensive with the grape, throughout the world.

## Order 3. MUCORALES.

The order Mucorales includes the more common moulds and are for the most part saprophytic on other plant substances. Even as saprophytes they may be responsible for a great deal of damage to food material especially to fruits in storage.

| | |
|---|---|
| Asexual reproduction by spores inclosed in sporangia; conidia wanting; sporangia with columella. | |
| Sporangial wall uniform throughout, dissolving or disintegrating, not cutinized. | Fam. 1. MUCORACEAE. |
| Sporangial wall cutinized in the upper portion which is persistent, the lower thin and deliquescing. | Fam. 2. PILOBOLACEAE. |
| Asexual reproduction by spores borne in a sporangium and conidia. | Fam. 3. CHOANOPHORACEAE. |

## Family 1. MUCORACEAE.

1. **RHIZOPUS** Ehr. Nova Acta Acad. Leop. **10**: 198. 1820.

1. **Rhizopus nigricans** Ehr. Nova Acta Acad. Leop. **10**: 198. 1829.

On decaying vegetables and as contamination in laboratory cultures, Porto Rico:—continental America; Europe.

Family 2. **PILOBOLACEAE.**

1. **PILOBOLUS** Tode, Fungi Meckl. **1**: 41. 1790.

1. **Pilobolus crystallinus** (Weber) Tode, Fungi Meckl. **1**: 41. 1790.
*Hydrogera crystallina* Weber; Wigg. Fl. Holsat. 110. 1780.
On horse dung, Porto Rico:—continental America; Europe.

Family 3. **CHOANOPHORACEAE.**

1. **CHOANEPHORA** Cunningham, Trans. Linn. Soc. II. **1**: 409. 1878.

1. **Choanephora Cucurbitarum** (Berk. & Rav.) Thaxt. Rhodora **5**:102. 1903.
*Rhopalomyces cucurbitarum* Berk. & Rav. Grevillea **3**: 109. 1875.
On *Abelmoschus esculentus* (L.) Moench. Porto Rico:—continental North America.

Order 4. **ENTOMOPHTHORALES.**

The Entomophthorales, as the name implies, are parasitic on flies, grasshoppers, and the larvae of beetles and other insects. When occurring on harmful insects they may be of use in checking the ravages of such enemies.

Family 1. **ENTOMOPHTHORACEAE.**

1. **EMPUSA** Cohn, Hedwigia **1**: 60, 1855.

1. **Empusa americania** Thaxter, Mem. Bost. Soc. Nat. Hist. **4**: 179. 1888.
On *Punellia* sp., Porto Rico:—continental North America.

2. **Empusa Fresenii** Nowak. Proc. Krak. Acad. Sci. **1883**: 171. 1883.
On sucking insects on various host plants, Porto Rico:—Europe.

3. **Empusa sphaerosperma** (Fres.) Thaxt. Mem. Boston Soc. Nat. Hist. **4**: 172. 1888.
*Entomophthora sphaerosperma* Fres. Bot. Zeit. **14**: 883. 1856.
On *Laphygma frugiperda*, Porto Rico:—continental America; Europe.

2. **ENTOMOPHTHORA** Fres. Bot. Zeit. **14**: 883. 1856.

1. **Entomophthora Aulicae** (Reich.) Winter in Rab. Krypt.-Fl. **1**: 78. 1884.
*Empusa Aulicae* Reich.; Bail, Pilzepizootien 1. 1869.
On *Ecpantheria eridanus*, Porto Rico:—Europe.

Sub-class 2. **ASCOMYCETES.**

This sub-class comprises one of the two great groups of the fungi and the many species are characterized by having their spores produced in closed sacs or asci from which they are forcibly ejected at maturity. The group includes a large number of parasitic species although many are saprophytes of no known economic importance.

| | |
|---|---|
| Vegetative mycelium usually wanting; asci not formed in special fruiting bodies. | Order 1. Saccharomycetales. |
| Vegetative mycelium present; asci formed in or on special fruiting bodies. | |
| Asci produced in a stroma-like matrix. | Order 2. Myriangiales. |

Asci not in a stroma-like matrix.
Asci arranged irregularly in the ascocarp. Order 3. ASPERGILLALES.
Asci produced in a perithecium.
Perithecia shield-shaped. Order 4. HEMISPHAERIALES.
Perithecia not shield-shaped.
Ostiolum wanting.
Perithecia dehiscent. Order 5. PERISPORIALES.
Perithecia indehiscent. Order 6. CORYNELIALES.
Ostiolum present and usually evident. Order 7. PSEUDOPERISPORIALES.
Otherwise like Perisporiales.
Otherwise not like Perisporiaceae.
Perithecia and stromata bright colored, red, yellow, blue, etc. Order 8. HYPOCREALES.
Perithecia and stromata black.
Perithecial wall wanting. Order 9. DOTHIDEALES.
Perithecial wall present.
Perithecia soft, membranaceous; plants occurring on dung. Order 10. FIMETARIALES.
Perithecia and stromata when present hard and carbonaceous, or subcarbonaceous. Order 11. SPHAERIALES.
Asci not produced in a closed perithecium but on a sporophore or apothecium and freely exposed at maturity.
Apothecia usually opening with a rounded or rarely irregular aperture. Order 12. PEZIZALES.
Apothecia opening with a slit-like aperture.
Fissure consisting of a simple cleft. Order 13. HYSTERIALES.
Fissure compound giving rise to a stellate aperture. Order 14. PHACIDIALES.

## Order 1. SACCHAROMYCETALES.

## Family 1. SACCHAROMYCETACEAE.

This order of plants includes the yeast plants and other low fungi. The yeasts are concerned in alcoholic fermentation and in the manufacture of bread. They are unicellular plants which reproduce by budding. Under rare conditions, however, they reproduce by the formation of spores endogenously. On account of the resemblance of these spores to those of the ascomycetes the order is usually included with the latter.

1. **PARASACCHAROMYCES** Beur. & Goug.; Anderson, Jour. Inf. Dis. 21: 380. 1917.

1. **Parasaccharomyces psilosis** (Ashford) comb. nov.

*Monilia psilosis* Ashford, Amer. Jour. Med. Sci. 154: 157. Au 1917.
*Parasaccharomyces Ashfordi* H. W. Anderson, Jour. Inf. Diseases 21: 380. O 1917.

Dr. Bailey K. Ashford, of the Institute of Tropical Medicine of Porto Rico, has kindly supplied the writers with the following information regarding this interesting human pathogen: "I consider this organism to be the definite factor in producing the sympton-complex known as "sprue." It colonizes in the human intestine, however, apparently only when a certain degree of acidity and an abundance of starch and sugar is furnished. It seems generally to require functional derangement of digestion, with a peculiar variety of food unbalance to provide an ideal intestinal enriching medium."

2. **SACCHAROMYCES** Meyer, Arch. Naturg. **42:** 100. 1838.

1. **Saccharomyces apiculatus** Rees, Bot. Unters. 84. 1870.

From fermenting cacao and coffee, Porto Rico:—Europe.

2. **Saccharomyces Cerevisiae** Meyen, Arch. Naturg. **42:** 100. 1838.

Bread and brewer's yeast, Porto Rico:—widely distributed.

3. **Saccharomyces ellipsoideus** Rees, Bot. Unters. 82. 1870.

From fermenting cacao, coffee and grape juice, Porto Rico:—Europe.

## Order 2. **MYRIANGIALES.**

### Family 1. **MYRIANGIACEAE.**

1. **MYRIANGIUM** Mont. & Berk. Hooker's Jour. Bot. **4:** 72. 1845.

1. **Myriangium Duriaei** Mont. & Berk. l. c.

On scale insects on various hosts, Porto Rico:—Cuba; continental America.

## Order 3. **ASPERGILLALES.**

This order includes plants of very diverse habits, such as the underground fungi, none of which have been reported from Porto Rico, also such forms as the green moulds belonging to the genus *Penicillium* and the similar genus *Aspergillus.* Both of these genera have been placed here because some of the species have ascigerous stages. Whether all of them produce the perfect stage is a question which cannot be answered.

### Family 1. **ASPERGILLACEAE.**

1. **ASPERGILLUS** (Micheli) Adans. Fam. Pl. **2:** 2. 1763.

1. **Aspergillus argentius** Speg. Rev. Agr. Univ. La Plata **1896:** 245.
*Eurotium argentium* Speg. Rev. Agr. Univ. La Plata **1896:** 228.
On dead sugar cane stalks, Porto Rico:—continental South America.

2. **Aspergillus flavus** Link, Ges. Nat. Freunde Berlin Mag. **3:** 16. 1809.

On *Pseudococcus Sacchari,* Porto Rico:—continental North America.
A common mold of tobacco, cloth, culture media and decaying vegetable matter.

3. **Aspergillus herbariorum** (Weber) Fischer in E. & P. Nat. Pfl. $1^1$: 301.
*Mucor herbariorum* Weber; Wiggs. Pr. Fl. Holsat. 111. 1780.
On dried specimens in herbaria, Porto Rico:—continental America; Europe; Asia; Africa; Australia.

4. **Aspergillus niger** Van Tiegh. Ann. Sci. Nat. V. **8**: 240. 1867.

Isolated from soil; also occurring as a citrous fruit rot and on plant material in damp chamber, Porto Rico:—Europe.

5. **Aspergillus roseus** (Pers.) Link; Berk. Engl. Fl. $5^2$: 340. 1836.

*Monilia rosea* Pers. Disp. Meth. Fung. 40. 1797.

Isolated from soil, Porto Rico:—Europe.

6. **Aspergillus terreus** Thom, Am. Jour. Bot. **5**: 85. 1918.

On musty tobacco in Porto Rico:—continental North America.

2. **CERATOCARPIA** Rolland, Bull. Soc. Myc. Fr. **12**: 2. 1896.

*Perisporiopsis* Stevens, Trans. Ill. Acad. Sci. **10**: 170. 1917. Not *Perisporiopsis* P. Henn. Hedwigia **43**: 83. 1904.

1. **Ceratocarpia Wrightii** (Berk. & Curt.) Toro, comb. nov.

*Perisporium Wrightii* Berk. & Curt. Grevillea **4**: 157. 1875.
*Perisporiopsis Wrightii* Stevens, l. c.

On *Opuntia* sp., Porto Rico:—continental North America.

3. **PENICILLIUM** Link, in Willd. Sp. Pl. $6^4$: 69. 1824.

1. **Penicillium crustaceum** (L.) Fries, Summa. Veg. Scand. 489. 1849.

*Mucor crustaceus* L. Sp. Pl. Ed. 2. 1656. 1763.

On dead plant material, Porto Rico:—Europe.

2. **Penicillium digitatum** (Pers.) Sacc. Fungi Ital. *894*. 1881.

*Monilia digitata* Pers. Syn. Fung. 693. 1801.

On fruit of species of *Citrus*. Common in all the citrous districts of Porto Rico:—Europe.

3. **Penicillium divaricatum** Thom, U. S. Dept. Agr. Bur. Anim. Ind. Bull. 118: 72. 1910.

Isolated from soil, Porto Rico:—continental North America.

4. **Penicillium italicum** Wehmer, Hedwigia **33**: 211. 1894.

On fruit of species of *Citrus*, Porto Rico:—Europe.

5. **Penicillium lilacinum** Thom, U. S. Dept. Agr. Bur. Pl. Ind. Bull. 118: 73. 1910.

Isolated from soil, Porto Rico:—continental North America.

6. **Penicillium luteum** Zukal, Sitz.-ber. Akad. Wien **48**: 561. 1889.

Isolated from soil, Porto Rico:—Europe; continental North America.

## Order 4. **HEMISPHAERIALES.**

Fred J. Seaver and Rafael A. Toro.

This order of black molds is characterized by possessing perithecia which are flat and shield-shaped instead of globose or subglobose. The perithecia are for the most part superficial as in the Perisporiales.
of shield radiate structure.

| | |
|---|---|
| Mycelium filamentous or absent, thiriothecia superficial and free. | Fam. 1. MICROTHYRIACEAE. |
| Mycelium forming a membrane of radiate structure. | Fam. 2. TRICHOPELTACEAE. |
| Shield not of radiate structure. | Fam. 3. HEMISPHAERIACEAE. |

## Family 1. **MICROTHYRIACEAE.**

### 1. **AMAZONIA** Theiss. Ann. Myc. **11:** 499. 1913.

1. **Amazonia asterinoides** (Winter) Theiss. l. c.

*Meliola asterinoides* Winter, Hedwigia **25:** 96. 1886.

On *Pothomorphe peltata* (L.) Miq. [*Piper peltatum* L.], St. Thomas:—West Africa.

### 2. **ASTERINA** Lév. Ann. Sci. Nat. III. **3:** 59. 1845.

1. **Asterina acanthopoda** Speg. Anal. Soc. Ci. Argent. **26:** 49. 1888.

On *Psychotria* sp., Porto Rico:—continental South America.

2. **Asterina Arnaudia** Ryan, Mycologia **16:** 184. 1924.

On *Passiflora multiflora* L., *Passiflora sexflora* A. Juss., Porto Rico:—endemic.

3. **Asterina Camelliae** Syd. & Butl. Ann. Myc. **9:** 389. 1911.

On *Miconia* sp. Erroneously reported on *Miconia splendens* (Sw.) Triana, Porto Rico:—India.

4. **Asterina carbonacea** Cooke, Grevillea **8:** 96. 1880. var. **Anacardii** Ryan, Mycologia **16:** 186. 1924.

On *Anacardium* sp., *Miconia prasina* (Sw.) DC., Porto Rico:—variety endemic.

5. **Asterina Chrysophylli** P. Henn. Hedwigia **48:** 12. 1908.

On *Miconia prasina* (Sw.) DC., *Chrysophyllum oliviforme* L., Porto Rico:—continental South America.

6. **Asterina Coccolobae** Ferd. & Winge, Bot. Tidssk. **29:** 10. 1908.

On *Coccolobis uvifera* (L.) Jacq., St. Croix:—endemic.

7. **Asterina Colubrinae** Ellis & Kelsey, Bull. Torrey Club **24:** 207. 1897.

On *Colubrina reclinata* (L'Her.) Brongn., St. Croix:—endemic.

8. **Asterina coriacella** Speg. (?) Bol. Acad. Ci. Cordoba **11:** 560. 1889.

*Asterina diplocarpa* var. *cestricola* Ryan, Mycologia **16:** 187. 1924.

On *Cestrum laurifolium* L'Her., *Cestrum macrophyllum* Vent., Porto Rico; St. Jan:—continental South America.

9. **Asterina correacola** Cooke & Massee, Grevillea **16:** 5. 1887.

On *Miconia prasina* (Sw.) DC., Porto Rico:—Australia.

10. **Asterina dilabens** Syd. Ann. Myc. **2:** 168. 1904.

On *Rhytidophyllum auriculatum* Hook., *Solanum rugosum* Dunal, *Tetrazygia elaeagnoides* (Sw.) DC., Porto Rico:—continental South America.

Var. **Hilliae** Ryan, Mycologia **16:** 187. 1924.

On *Hillia parasitica* Jacq., Porto Rico:—variety endemic.

11. **Asterina diplocarpa** Cooke, Grevillea **10**: 129. 1882.

*Asterina Sidae* Earle, Bull. N. Y. Bot. Gard. **3**: 310. 1905.
*Asterinia sidicola* Ryan, Mycologia **16**: 181. 1924.

On *Sida carpinifolia* L.f., *Abutilon* sp.,—Porto Rico:—continental South America.

12. **Asterina Drypetis** Ryan, Mycologia **16**: 180. 1924.

On *Drypetes lateriflora* (Sw.) Urban, Porto Rico:—endemic.

13. **Asterina Elaeocarpi** Syd. Abh. Zool.-bot. Ges. Wien **7**[3]: 73.

On *Herpetica alata* (L.) Raf., Porto Rico.

14. **Asterina Fawcetti** Ryan, Mycologia **16**: 180. 1924.

On *Eugenia buxifolia* (Sw.) Willd., Mona Island:—endemic.

15. **Asterina Genipae** Ryan, Mycologia **16**: 180. 1924.

On *Genipa americana* L., Porto Rico:—endemic.

16. **Asterina guianensis** Ryan, Mycologia **16**: 182. 1924.

On *Tamonea guianensis* Aubl., Porto Rico:—endemic.

17. **Asterina Hippocrateae** Ryan, Mycologia **16**: 181. 1924.

On *Hippocratea volubilis* L., Porto Rico:—endemic.

18. **Asterina inaequalis** Mont. Ann. Sci. Nat. IV. **5**: 340. 1856.

*Asterina nodulosa* Speg. Bol. Acad. Ci. Cordoba **11**: 561. 1889.
On *Hirtella triandra* Sw., Porto Rico:—continental South America.

19. **Asterina Ixorae** Ryan, Mycologia **16**: 182. 1924.

On *Ixora ferrea* (Jacq.) Benth., Porto Rico:—endemic.

20. **Asterina Kernii** Toro, Mycologia **17**: 133. 1925.

On *Brunellia comocladifolia* H. & B., Porto Rico:—endemic.

21. **Asterina Melastomacearum** Ryan, Mycologia **16**: 186. 1924.

On *Miconia racemosa* (Aubl.) DC. (Erroneously reported on *Miconia impetiolaris* (Sw.) D. Don), Porto Rico:—endemic.

22. **Asterina Myrciae** Ryan, Mycologia **16**: 186. 1924.

On *Eugenia* sp., *Myrcia splendens* (Sw.) DC., Porto Rico:—endemic.

23. **Asterina passifloricola** Ryan, Mycologia **16**: 183. 1924.

On *Passiflora* sp., Porto Rico:—endemic.

24. **Asterina portoricensis** Ryan, Mycologia **16**: 185. 1924.

On *Solanum* sp., Porto Rico:—endemic.

25. **Asterina Psidii** Ryan, Mycologia **16**: 185. 1924.

On *Psidium Guajava* L., Porto Rico:—endemic.

26. **Asterina Psychotriae** Ryan, Mycologia **16**: 185. 1924.

On *Psychotria pubescens* Sw., Porto Rico:—endemic.

27. **Asterina punctiformis** Lév. Ann. Sci. Nat. III. **5**: 267. 1846.

On *Gesneria* sp., Porto Rico:—Java.

28. **Asterina Racemosae** Ryan, Mycologia **16**: 182. 1924.

*Asterina miconicola* Ryan, Mycologia **16**: 182. 1924.

On *Miconia racemosa* (Aubl.) DC., (Erroneously reported on *Miconia Sintenisii* Cogn., and *Miconia impetiolaris* (Sw.) D. Don), Porto Rico:—endemic.

29. **Asterina Schroeteri** (Rehm) Theiss. Ann. Myc. **10**: 167. 1912.

*Seynesia Schroeteri* Rehm, Hedwigia **37**: 326. 1898.

On *Chrysobalanus Icaco* L., *Chrysobalanus* sp., Porto Rico:—continental South America.

30. **Asterina solanicola** Berk. & Curt. Jour. Linn. Soc. **10**: 374. 1868.

*Asterina triloba* Earle, Bull. N. Y. Bot. Garden **3**: 310. 1905.

On *Cestrum laurifolium* L'Her., *C. macrophyllum* Vent., *Pavonia spinifex* (L.) Cav. and *Clusia Gundlachii* Stahl, Porto Rico:—Cuba.

31. **Asterina spathulata** (Ryan) nom. nov.

*Asterina Miconiae* Ryan, Mycologia **16**: 181. 1924. Not *A. Miconiae* Theiss. Ann. Myc. **11**: 440. 1913.

On *Miconia racemosa* (Aubl.) DC., *M. thomasiana* DC., Porto Rico:—endemic.

32. **Asterina Sydowiana** Ryan, Mycologia **16**: 184. 1924.

On *Micropholis* sp., Porto Rico:—endemic.

33. **Asterina Tacsoniae** Pat. Bull. Soc. Myc. Fr. **9**: 147. 1893. var. **Passiflorae** Ryan, Mycologia **16**: 183. 1924.

On *Passiflora suberosa* L., Porto Rico:—variety endemic.

34. **Asterina Tetrazygiae** Ryan, Mycologia **16**: 183. 1924.

On *Tetrazygia elaeagnoides* (Sw.) DC., *Tetrazygia* sp., Porto Rico:—endemic.

35. **Asterina Theissenia** Ryan, Mycologia **16**: 187. 1924.

On *Miconia rubiginosa* (Bonpl.) DC., Porto Rico:—endemic.

36. **Asterina transiens** Theiss. Abh. Zool.-bot. Ges. Wien **7**[3]: 42. 1913.

On *Miconia racemosa* (Aubl.) DC., Porto Rico:—Brazil.

37. **Asterina vagans** Speg. Anal. Soc. Cí. Argent. **26**: 48. 1888.

On *Tournefortia laurifolia* Vent., Porto Rico:—continental South America.

38. **Asterina versipoda** Ryan, Mycologia **16**: 188. 1924.

On unknown host, Porto Rico:—endemic.

Doubtful Species.

Asterina Eugeniae (Mont.) Sacc. Syll. Fung. **1**: 49. 1882.

*Dothidea Eugeniae* Mont. Ann. Sci. Nat. II. **8**: 359. 1837.

This is apparently the first fungus reported from Porto Rico. No material is available for study and its identity is therefore doubtful.

### 3. **ASTERINELLA** Theiss. Ann. Myc. **10**: 160. 1912.

1. **Asterinella cylindrotheca** (Speg.) Theiss. Broteria **10**: 114. 1912.

*Asterina cylindrotheca* Speg. Bol. Acad. Ci. Cordoba **11**: 183. 1889.

On *Eugenia* sp., Porto Rico:—continental South America.

2. **Asterinella Hippeastri** Ryan, Mycologia **16**: 188. 1924.

On *Hippocratea volubilis* L. (Erroneously reported as *Hippeastrum* sp.), Porto Rico:—endemic.

3. **Asterinella Ixorae** Ryan, Mycologia **16**: 189. 1924.

On *Ixora ferrea* (Jacq.) Benth., Porto Rico:—endemic.

4. **Asterinella Melastomacearum** Ryan, Mycologia **16**: 189. 1924.

On Melastomaceae, Porto Rico:—endemic.

5. **Asterinella Phoradendri** Ryan, Mycologia **16**: 189. 1924.

On *Phoradendron racemosum* (Aubl.) Krug & Urban, Porto Rico:—endemic.

### 4. **AULOGRAPHUM** Lib. Crypt. Ard. *272*. 1834.

1. **Aulographum Cestri** Ryan, Mycologia **16**: 190. 1924.

On *Cestrum* sp., Porto Rico:—endemic.

2. **Aulographum culmigenum** Ellis, Bull. Torrey Club **8**: 65. 1881.

On *Miconia laevigata* (L.) DC., Porto Rico:—continental North America.

3. **Aulographum melioloides** Cooke & Massee, Grevillea **18**: 6. 1889.

On *Mammea americana* L., Porto Rico:—Australia.

### 5. **CALOTHYRIUM** Theiss. Ann. Myc. **10**: 160. 1912.

This genus may be identical with *Microthyrium*.

1. **Calothyrium Hippocratea** Ryan, Mycologia **16**: 179. 1924.

On *Hippocratea volubilis* L., Porto Rico:—endemic.

2. **Calothyrium Ingae** Ryan, Mycologia **16**: 179. 1924.

On *Inga Inga* (L.) Britton [*Inga vera* Willd.], Porto Rico:—endemic.

3. **Calothyrium Psychotriae** Ryan, Mycologia **16**: 179. 1924.
On *Psychotria* sp., Porto Rico:—endemic.

6. **CAUDELLA** Syd. Ann. Myc. **14**: 90. 1916.

1. **Caudella Psidii** Ryan, Mycologia **16**: 179. 1924.
On *Psidium Guajava* L., Porto Rico:—endemic.

7. **ECHIDNODELLA** Theiss. & Syd. Ann. Myc. **15**: 250. 1917.

1. **Echidnodella Fourcroyae** Ryan, Mycologia **16**: 195. 1924.
On *Furcraea tuberosa* Ait. f., Porto Rico:—endemic.

2. **Echidnodella Melastomacearum** Ryan, Mycologia **16**: 195. 1924.
On *Miconia rubiginosa* (Bonpl.) DC., *Miconia* sp., Porto Rico:—endemic.

3. **Echidnodella Miconiae** Ryan, Mycologia **16**: 195. 1924.
On *Miconia laevigata* (L.) DC., Porto Rico:—endemic.

4. **Echidnodella Myrciae** Ryan, Mycologia **16**: 195. 1924.
On *Myrcia splendens* (Sw.) DC., Porto Rico:—endemic.

5. **Echidnodella Rondeletiae** Ryan, Mycologia **16**: 195. 1924.
On *Rondeletia* sp., Porto Rico:—endemic.

8. **ECHIDNODES** Theiss. & Syd. Ann. Myc. **15**: 422. 1917.

1. **Echidnodes Bromeliacearum** (Rehm) Theiss. & Syd. Ann. Myc. **15**: 422. 1917
*Lembosia Bromeliacearum* Rehm, Hedwigia **39**: 210. 1900.
*Echidnodes Bromeliae* Ryan, Mycologia **16**: 194. 1924.
On Bromeliaceae, Porto Rico:—continental South America.

2. **Echidnodes Mammeae** Ryan, Mycologia **16**: 194. 1924.
On *Mammea americana* L., Porto Rico:—endemic.

3. **Echidnodes microspora** (Chardon) comb. nov.
*Lembosia microspora* Chardon, Mycologia **13**: 282. 1921.
The fungus falls under *Echidnodes* rather than in *Lembosia* since the mycelium has no hyphopodia.
On *Ocotea leucoxylon* (Sw.) Mez., Porto Rico:—endemic.

9. **ENGLERULASTER** Höhn. Sitz.-ber. Akad. Wien. **119**: 62. 1910.

1. **Englerulaster asperulispora** (Gaill.) Theiss. Ann. Myc. **10**: 171. 1912.
*Asterina asperulispera* Gaill. Bull. Soc. Myc. Fr. **13**: 180. 1897.
On *Ilex nitida* (Vahl) Maxim, Porto Rico:—continental South America.

10. **LEMBOSIA** Lév. Ann. Sci. Nat. III. **3**: 58. 1845.

1. **Lembosia Coccolobae** Earle, Bull. N. Y. Bot. Gard. **3**: 301. 1905. On *Coccolobis uvifera* (L.) Jacq., Porto Rico:—endemic.

2. **Lembosia Dendrochili** Lév. Ann. Sci. Nat. III. **3**: 59. 1845.
*Lembosia Agaves* Earle, Muhlenbergia **1**: 15. 1901.
Reported on leaves of *Agave sisalana* Perrine, Porto Rico:—Java.

3. **Lembosia Melastomatum** Mont. Ann. Sci. Nat. IV. **5**: 373. 1856.
*Lembosia diffusa* Winter, Hedwigia **24**: 30. 1885.
On species of *Miconia*, Porto Rico:—continental South America.

4. **Lembosia Philodendri** P. Henn. Hedwigia **43**: 89. 1904.
On *Coccolobis uvifera* (L.) Jacq., Porto Rico:—continental South America.

5. **Lembosia portoricensis** Ryan, Mycologia **16**: 190. 1924.
On *Coccolobis laurifolia* Jacq., Porto Rico:—endemic.

6. **Lembosia Rapaneae** Ryan, Mycologia **16**: 190. 1924.
On *Rapanea* sp., Porto Rico:—endemic.

7. **Lembosia Rolliniae** Rehm, Ann. Myc. **11**: 442. 1913.
On *Tamonea guianensis* Aubl., Porto Rico:—continental South America.

8. **Lembosia Sclerolobii** P. Henn. Hedwigia **43**: 265. 1904.
On *Miconia* sp., Porto Rico:—continental South America.

9. **Lembosia Sepotae** Ryan, Mycologia **16**: 191. 1924.
On *Calophyllum antillanum* Britton, Porto Rico:—endemic.

10. **Lembosia tenella** Lév. Ann. Sci. Nat. III. **3**: 58. 1845.
On *Coccolobis uvifera* (L.) Jacq., Porto Rico:—Tahiti; Ceylon.

11. **LEMBOSIDIUM** Speg. Bol. Acad. Ci. Cordoba **26**: 342. 1923.

1. **Lembosidium portoricense** Speg. Bol. Acad. Ci. Cordoba **26**: 342. 1923.
Described from living leaves of *Coccolobis pirifolia* Desf., Porto Rico:—endemic.

12. **MICROTHYRIUM** Desm. Ann. Sci. Nat. II. **15**: 137. 1841.

1. **Microthyrium Calophylli** Ryan, Mycologia **16**: 179. 1924.
On *Calophyllum* sp., Porto Rico:—endemic.

2. **Microthyrium Laguncullariae** Winter; Rab.-Wint.-Paz. Fungi Eu. *3653;* Hedwigia **29**: 159. 1890.
On *Laguncularia racemosa* (L.) Gaertn., Porto Rico:—continental South America.

3. **Microthyrium Urbani** Bres. in Engler, Bot. Jahrb. **17**: 500. 1893.
On *Schaefferia frutescens* Jacq., Porto Rico:—endemic.

13. **MORENOELLA** Speg. Anal. Soc. Ci. Argent. **19**: 258. 1885.

1. **Morenoella Calami** Rac. Parasit. Algen und Pilze Java's **3**: 28. 1900.
On *Crescentia Cujete* L., Orchidaceae, Porto Rico:—Java.

2. **Morenoella Cestri** Ryan, Mycologia **16**: 192. 1924.
On unknown host, Porto Rico:—endemic.

3. **Morenoella decalvans** (Pat.) Theiss.; Ryan, Mycologia **16**: 192. 1916.
*Lembosia decalvans* Pat. Ann. Jard. Bot. Buitenzorg 1897: 122.
On unknown host, Porto Rico:—Java.

4. **Morenoella decalvans** var. **Laugeriae** Ryan, Mycologia **16**: 193. 1924.
On *Laugeria resinosa* Vahl, Porto Rico:—variety endemic.

5. **Morenoella decalvans** var. **Rondeletiae** Ryan, Mycologia **16**: 192. 1924.
On *Rondeletia* sp., Porto Rico:—variety endemic.

6. **Morenoella decalvans** var. **Stigmatophylli** Ryan, Mycologia **16**: 193. 1924.
On *Stigmaphyllon* [*Stigmatophyllum*] sp., Porto Rico:—variety endemic.

7. **Morenoella dothideoides** (Ellis & Ev.) Höhn. Sitz.-ber. Akad. Wien. **118**:—7. 1909.
*Asteridium dothideoides* Ellis & Ev. Bull. Torrey Club **22**: 436. 1895.
On *Miconia racemosa* (Aubl.) DC., Porto Rico:—continental North America.

8. **Morenoella dothideoides** var. **impetiolaris** Ryan, Mycologia **16**: 192. 1924.
On *Miconia prasina* (Sw.) DC., Porto Rico:—variety endemic.

9. **Morenoella gigantea** Ryan, Mycologia **16**: 194. 1924.
On *Miconia prasina* (Sw.) DC., Porto Rico:—variety endemic.

10. **Morenoella Laugeriae** Ryan, Mycologia **16**: 192. 1924.
On *Laugeria resinosa* Vahl, Porto Rico:—endemic.

11. **Morenoella Melastomacearum** Ryan, Mycologia **16**: 194. 1924.
On Melastomaceae, Porto Rico:—endemic.

12. **Morenoella Miconiae** Ryan, Mycologia **16**: 191. 1924.
On *Miconia prasina* (Sw.) DC., *Tamonea macrophylla* (D. Don) Krasser, Porto Rico:—endemic.

13. **Morenoella miconicola** Ryan, Mycologia **16**: 191. 1924.
On *Miconia prasina* (Sw.) DC., Porto Rico:—endemic.

14. **Morenoella Pothodei** var. **laevigatae** Ryan, Mycologia **16**: 193. 1924.
On *Miconia laevigata* (L.) DC., Porto Rico:—variety endemic.

15. **Morenoella portoricensis** Speg. Bol. Acad. Ci. Cordoba **26**: 343. 1923.
On *Ocotea leucoxylon* (Sw.) Mez., Porto Rico:—endemic.

16. **Morenoella Psychotriae** Ryan; Mycologia **16**: 194. 1924.
On unknown host, Porto Rico:—endemic.

17. **Morenoella Whetzelii** Toro, Mycologia **17**: 134. 1925.

On *Elsota* sp., [reported as *Securidaea volubilis* L.], Porto Rico:—endemic.

14. **SEYNESIA** Sacc. Syll. Fung. **2**: 668. 1883.

1. **Seynesia Coccolobae** Ryan, Mycologia **16**: 178. 1924.

On *Coccolobis laurifolia* Jacq., Porto Rico:—endemic.

2. **Seynesia Cordiae** Ryan, Mycologia **16**: 178. 1924.

On *Cordia sulcata* DC., Porto Rico:—endemic.

## Family 2. **TRICHOPELTACEAE.**

1. **TRICHOPELTIS** Speg. Bol. Acad. Ci. Cordoba **11**: 571. 1889.

1. **Trichopeltis reptans** (Berk. & Curt.) Speg. Bol. Acad. Ci. Cordoba **11**: 574. 1889.

*Asterina reptans* Berk. & Curt. Jour. Linn. Soc. **10**: 373. 1868.

On living leaves of *Philodendron Krebsii* Schott, Porto Rico:—continental South America.

## Family 3. **HEMISPHAERIACEAE.**

1. **ASTERIDIELLINA** nom. nov.

*Asteridium* Speg. Bol. Acad. Ci. Cordoba **26**: 348. 1923. Not *Asteridium* Sacc. 1891.

1. **Asteridiellina portoricensis** (Speg.) comb. nov.

*Asteridium portoricense* Speg. loc. cit.

The genus *Asteridium* Speg. is untenable because the name was preoccupied by *Asteridium* Sacc. which according to v. Höhnel is a synonym of *Meliola* Fries.

On living leaves of *Ocotea leucoxylon* (Sw.) Mez., Porto Rico:—endemic.

2. **CLYPEOLUM** Speg. Anal. Soc. Ci. Argent. **12**:—[54]. 1881.

1. **Clypeolum scutelliforme** Rehm, Hedwigia **37**: 322. 1898.

On undertermined host, Porto Rico:—continental South America.

3. **MICROPELTIDIUM** Speg. Bol. Acad. Ci. Cordoba **26**: 350. 1823.

1. **Micropeltidium monense** Speg. Bol. Acad. Ci. Cordoba **26**: 351. 1923.

On living leaves of *Amyris elemifera* L., Mona Island:—endemic.

2. **Micropeltidium portoricense** Speg. Bol. Acad. Ci. Cordoba **26**: 351. 1923.

On living leaves of *Comocladia glabra* (Schultes) Spreng., Porto Rico:—endemic.

4. **MICROPELTIS** Mont. Pl. Cell. Cuba 325. 1838.

1. **Micropeltis aeruginascens** Rehm, Ascomycetes *2074*. 1913. (hyponym)

On *Rourea surinamensis* Miq., Porto Rico:—Philippine Islands.

2. **Micropeltis albo-marginata** Speg. Bol. Acad. Ci. Cordoba **11**: 572. 1889.

On undetermined host, Porto Rico:—endemic.

3. **Micropeltis Marattiae** P. Henn. Hedwigia **34:** 13. 1895.
On *Adiantum latifolium* Lam., Porto Rico:—Natal.

5. **SCOLECOPELTELLA** Speg. Bol. Acad. Ci. Cordoba **26:** 354. 1923.

1. **Scolecopeltella microcarpa** Speg. Bol. Acad. Ci. Cordoba **26:** 354. 1923.
On living leaves of *Philodendron Krebsii* Schott, Porto Rico:—endemic.

2. **Scolecopeltella portoricensis** Speg. Bol. Acad. Ci. Cordoba **26:** 354. 1923.
On living leaves of *Dipholis salicifolia* (L.) A.DC., Porto Rico:—endemic.

6. **SCOLECOPELTIS** Speg. Bol. Acad. Ci. Cordoba **11:** 574. 1889.

1. **Scolecopeltis Cestri** Toro, Mycologia **17:** 137. 1925.
On *Cestrum* sp. associated with *Aulographum Cestri*, Porto Rico:—endemic.

2. **Scolecopeltis Chardonii** Toro, Mycologia **17:** 138. 1925.
On *Maytenus elongata* (Urban) Britton, Porto Rico:—endemic.

3. **Scolecopeltis Ingae** Toro, Mycologia **17:** 138. 1925.
On *Inga Inga* (L.) Britton, *Inga laurina* (Sw.) Willd., Porto Rico:—endemic.

4. **Scolecopeltis Ionopsidis** Toro, Mycologia **17:** 137. 1925.
On *Ionopsis utricularioides* (Sw.) Lindl., Porto Rico:—endemic.

5. **Scolecopeltis longispora** (Earle) Toro, Mycologia **17:** 136. 1925.
*Micropeltis longispora* Earle, Bull. N. Y. Bot. Garden **3:** 311. 1905.
On *Coffea arabica* L., Porto Rico:—endemic.

6. **Scolecopeltis micropeltiformis** Toro, Mycologia **17:** 137. 1925.
On *Casearia sylvestris* Sw., Porto Rico:—endemic.

7. **Scolecopeltis pachyasca** Speg. Bol. Acad. Ci. Cordoba **26:** 353. 1923.
On living leaves of *Coccolobis laurifolia* Jacq., Porto Rico:—endemic.

8. **Scolecopeltis portoricensis** Speg. Bol. Acad. Ci. Cordoba **26:** 352. 1923.
On living leaves of *Canella Winterana* (L.) Gaertn., Porto Rico:—endemic.

## Order 5. PERISPORIALES.

The order includes the powdery mildews, few of which occur in the tropics, and the sooty molds which are very abundant in tropical lands, occurring mostly as epiphytes following insects and often destroying them.

| | |
|---|---|
| Vegetative mycelium white. | Fam. 1. Erysiphaceae. |
| Vegetative mycelium dark or occasionally wanting. | |
| Mycelial hyphae not slimy, septate, branched net-like; peridium parenchymatous, not slimy. | Fam. 2. Perisporiaceae. |
| Mycelium when septate, bound together into skein-like masses; perithecia composed of slimy rounded cells or of septate, slimy meridional hyphae. | Fam. 3. Capnodiaceae. |

## Family 1. **ERYSIPHACEAE.**

### 1. **ERYSIPHE** DC. Fl. Fr. **2:** 272. 1805.

**1. Erysiphe Cichoracearum** DC. Fl. Fr. **2:** 274. 1805.

On *Cosmos caudatus* H. B. K., *Eupatorium microstemon* Cass., *Solanum torvum* Sw., Porto Rico:—continental North America; Europe; Asia; Africa.

**2. Erysiphe communis** (Wallr.) Fries, Summa Veg. Scand. 406. 1849.

*Alphitomorpha communis* Wallr. Fl. Crypt. Ger. **2:** 758. 1833.

On *Sida* sp., St. Croix; St. Jan:—widely distributed.

**3. Erysiphe Galeopsidis** DC. Fl. Fr. **6:** 108. 1815.

On *Eupatorium microstemon* Cass., Porto Rico:—continental North America; Europe; Asia.

**4. Erysiphe Malachrae** Seaver, sp. nov.

Mycelium scant but covering the greater part of the upper side of the leaf, giving it a whitish appearance, the tissue of the leaf being slightly discolored; perithecia numerous, at first white, becoming pale brown, subglobose, reaching a diameter of 60–75 $\mu$, almost devoid of appendages, usually containing three asci; asci ellipsoid, about 30 $\times$ 40 $\mu$, apparently 5-spored; spores ellipsoid, about 14 $\times$ 20 $\mu$, hyaline.

On living leaves of *Malachra capitata* L., Porto Rico:—endemic.

This species is unique in many ways so that its position in the genus is open to question although it is undoubtedly one of the Erysiphaceae. The perithecia are unusually small, almost devoid of appendages and at most only pale brown instead of black. So far as we are aware this is the only member of the family reported from Porto Rico with the ascigerous stage developed at all. Later collections may give us more detailed information on the species and its relationship.

**5. Erysiphe Polygoni** DC. Fl. Fr. **2:** 273. 1805.

On *Arracacia xanthorrhiza* Bancr., *Ditremexa occidentalis* (L.) Britton & Rose [*Cassia occidentalis* L.], *Emelista tora* (L.) Britton & Rose [*Cassia tora* L.], *Dahlia* sp., *Phaseolus adenanthus* G. F. W. Mey., *P. lathyroides* L., *P. vulgaris* L.; also reported by Stevenson on *Chamaecrista aeschinomene* (DC.) Greene, *C. diphylla* (L.) Greene, *Pisum sativum* L., *Vigna repens* (L.) Kuntze., *V. unguiculata* (L.) Walp., Porto Rico; *Phaseolus* sp., Mona Island:—continental North America; Europe; Asia; Africa; Australia.

### 2. **MICROSPHAERA** Lév. Ann. Sci. Nat. III. **15:** 381. 1851.

**1. Microsphaera diffusa** Cooke & Peck, Jour. Bot. **10:** 13. 1872.

On *Crotalaria retusa* L., *Manihot Manihot* (L.) Cockerell, *Meibomia scorpiurus* (Sw.) Kuntze, *M. supina* (Sw.) Kuntze; also reported by Stevenson on *Meibomia adscendens* (Sw.) Kuntze, *M. purpurea* (Mill.) Vail [*M. tortuosa* (Sw.) Kuntze], Porto Rico; *Meibomia* sp., Mona Island:—continental North America.

The specific determination of the fungus is somewhat doubtful since in most cases the conidial stage only has been found.

**2. Microsphaera Euphorbiae** Peck, Ann. Rep. N. Y. State Mus. **26:** 80. 1874.

On *Chamaesyce hyssopifolia* (L.) Small, *C. hypericifolia* (L.) Millsp.; also reported by Stevenson on *Hibiscus sabdariffa* L., *Manihot Manihot* (L.) Cockerell, Porto Rico; *Chamaesyce hypericifolia* (L.) Millsp., Mona Island:—continental North America.

This like the preceding species is known from Porto Rico only in its conidial stage.

3. **SPHAEROTHECA** Lév. Ann. Sci. Nat. III. **15**: 138. 1851.

1. **Sphaerotheca Humuli** (DC.) Burr. Bull. Ill. State Lab. Nat. Hist. **2**: 400. 1887.

*Erysiphe Humuli* DC. Fl. Fr. **6**: 106. 1815.

On *Bidens pilosa* L. [*Bidens leucantha* (L.) Willd.], *B. reptans* (L.) G. Don, *Cosmos* sp., *Melanthera canescens* (Kuntze) O. E. Schultz, *Rosa* sp. (cult.), *Verbena* sp. (cult.); also reported by Stevenson on *Ocimum micranthum* Willd., Porto Rico:—continental North America; Europe; Asia.

Most Porto Rican specimens show conidia only.

## Family 2. **PERISPORIACEAE.**

Fred J. Seaver and Rafael A. Toro.

1. **APPENDICULELLA** Höhn. Sitz.-ber. Akad. Wien **128**: 556. 1919.

1. **Appendiculella arecibensis** (Stevens) Toro, Mycologia **17**: 144. 1925.

*Meliola arecibensis* Stevens, Ill. Biol. Monog. **2**[4]: 23. 1916.

On *Acalypha bisetosa* Bert., Porto Rico:—endemic.

2. **Appendiculella calostroma** (Desm.) Höhn. Sitz-ber. Akad. Wien **128**: 556. 1919.

*Sphaeria calostroma* Desm. Bull. Soc. Bot. Fr. **4**: 1011. 1857.
*Chaetosphaeria calostroma* Sacc. Syll. Fung. **2**: 95. 1883.
*Meliola manca* Ellis & Mart. Am. Nat. **17**: 1284. 1883.
*Meliola sanguinea* Ellis & Ev. Jour. Myc. **2**: 42. 1886.
*Meliola Puiggarii* Speg. Bol. Acad. Ci. Cordoba **11**: 492. 1889.
*Meliola rubicola* P. Henn. Hedwigia **43**: 140. 1904.
*Meliola calostroma* Höhn. Ann. Myc. **15**: 363. 1917.
*Irene manca* Theiss. & Syd. Ann. Myc. **15**: 461. 1917.
*Irene Puiggarii* Doidge, Trans. Roy. Soc. South Africa **9**: 122. 1919.

On *Myrica cerifera* L., *Rubus* sp., Porto Rico:—continental North and South America; Europe; Asia.

3. **Appendiculella Calophylli** (Stevens) Toro, Mycologia **17**: 144. 1925.

*Meliola Calophylli* Stevens, Ill. Biol. Monog. **2**[4]: 22. 1916.

On *Calophyllum antillanum* Britton [*Calophyllum Calaba* Jacq. not L.], Porto Rico:—endemic.

4. **Appendiculella compositarum** (Earle) Toro, Mycologia **17**: 144. 1925.

*Meliola compositarum* Earle, Bull. New York Bot. Garden **3**: 306. 1905.

On *Mikania cordifolia* (L. f.) Willd., *Osmia odorata* (L.) Sch. Bip. [*Eupatorium odoratum* L.], Porto Rico:—endemic.

5. **Appendiculella compositarum portoricensis** (Stevens) comb. nov.

*Meliola compositarum* var. *portoricensis* Stevens, Ill. Biol. Monog. **2**[4]: 22. 1916.

On *Eupatorium dolicholepis* (Urban) Britton, *Critonia portoricensis* (Urban) Britton & Wilson, Porto Rico:—endemic.

6. **Appendiculella tuberculata** (Stevens) Toro, Mycologia **17**: 144. 1925.

*Meliola tuberculata* Stevens, Ill. Biol. Monog. **2**[4]: 22. 1916.

On unknown host, Porto Rico:—endemic.

2. **DIMERIELLA** Speg. Rev. Mus. La Plata **15**: 12. 1908.

1. **Dimeriella Cordiae** (P. Henn.) Theiss. Beih. Bot. Centr. **29**[2]: 67. 1912.

*Dimerosporium Cordiae* P. Henn. Hedwigia **48**: 4. 1908.

On *Cordia sulcata* DC., Porto Rico:—continental South America.

2. **Dimeriella fumagina** (Dearn. & Barth.) Stevens; Stevenson, Jour. Dept. Agr. Porto Rico **2**: 136. 1918.

*Asterina fumagina* Dearn. & Barth. Mycologia **9**: 349. 1917.
*Dimeriella Olyrae* Stevens, Trans. Ill. Acad. Sci. **10**: 167. 1917.

On *Olyra latifolia* L., also reported by Stevenson on *Lasiacis Sloanei* (Griseb.) Hitchc., Porto Rico:—endemic.

3. **DIMERINA** Theiss. Ann. Myc. **10**: 5. 1912.

1. **Dimerina eutricha** (Sacc. & Berl.) Theiss. Beih. Bot. Centr. **29**[2]: 65. 1912.

*Dimerosporium eutrichum* Sacc. & Berl. Rev. Myc. **7**: 156. 1885.

On *Meliola Psychotriae* and *Meliola hyptidicola*, Porto Rico:—continental South America.

2. **Dimerina Jacquiniae** Garman, Mycologia **7**: 337. 1915.

*Dimerina monensis* Stevens, Bot. Gaz. **69**: 254. 1920.

On *Jacquinia Barbasco* (Loefl.) Mez., Mona Island:—endemic.
The two above named species were based on the same collection number apparently by mistake.

4. **DIMERIOPSIS** Stevens, Trans. Ill. Acad. Sci. **10**: 171. 1917.

1. **Dimeriopsis arthrostylidicola** Stevens, Trans. Ill. Acad. Sci. **10**: 171. 1917.

On *Arthrostylidium sarmentosum* Pilger, Porto Rico:—endemic.

5. **DIMERIUM** Authors not Sacc. & Syd. in Sacc. Syll. Fung. **17**: 537. 1905.

1. **Dimerium piceum** (Berk. & Curt.) Theiss. Ann. Myc. **10**: 3. 1912.

*Asterina picea* Berk. & Curt. Jour. Linn. Soc. **10**: 374. 1868.

On different species of *Meliola* on a variety of hosts, Porto Rico:—Cuba; continental South America.
According to Theissen and Sydow, *Dimerosporium tropicale* Speg. is a synonym of the above.

2. **Dimerium Stevensii** Garman, Mycologia **7**: 337. 1915.

On *Varronia corymbosa* (L.) Desv., Porto Rico:—endemic.

6. *__HALSTEDIA__ Stevens, Bot. Gaz. **69**: 253. 1920.

1. **Halstedia portoricensis** Stevens, Bot. Gaz. **69**: 253. 1920.

On *Sideroxylon foetidissimum* Jacq., Porto Rico:—endemic.

7. **HYALODERMA** Speg. Anal. Soc. Ci. Argent. **17**: 131. 1883.

1. **Hyaloderma piliderum** Pat. Bull. Soc. Myc. Fr. **4**: 102. 1888.

On the mycelium of a *Meliola* on some grass, Porto Rico:—continental South America.

8. **IRENE** Theiss. & Syd. Ann. Myc. **15**: 194. 1917.

1. **Irene aibonitensis** (Stevens) Toro, Mycologia **17**: 140. 1925.

*Meliola aibonitensis* Stevens, Ill. Biol. Monog. **2**[4]: 16. 1916.

On *Daphnopsis caribaea* Griseb., Porto Rico:—endemic.

* The position of this genus is uncertain and according to Stevens, it represents a transition between the Perisporiaceae on the one hand and the Dothideaceae.

2. **Irene cyclopoda** (Stevens) Toro, Mycologia **17**: 140. 1925.
*Meliola cyclopoda* Stevens, Ill. Biol. Monog. **2**[4]: 16. 1925.
On *Pseudelephantopus spicatus* (Juss.) Rohr., Porto Rico:—endemic.

3. **Irene glabra** (Berk. & Curt.) Toro, Mycologia **17**: 139. 1925.
*Meliola glabra* Berk. & Curt. Jour. Linn. Soc. **10**: 392. 1868.
On *Piper aduncum* L., Porto Rico:—Cuba.

4. **Irene glabroides** (Stevens) Toro, Mycologia **17**: 142. 1925.
*Meliola glabroides* Stevens, Ill. Biol. Monog. **2**[4]: 18. 1916.
*Meliola glabroides* var. *Schlegeliae* Stevens, l.c.
On *Nectandra patens* (Sw.) Griseb., *Schlegelia* sp., *Piper aduncum* L., *P. marginatum* L., *Sauvagesia erecta* L., *Solanum persicifolium* Dun., *S. rugosum* Dun.; *Valerianoides cayennense* (L. C. Rich.) Kuntze, Porto Rico:—endemic.

5. **Irene hyptidicola** (Stevens) Toro, Mycologia **17**: 139. 1925.
*Meliola hyptidicola* Stevens, Ill. Biol. Monog. **2**[4]: 16. 1916.
On *Hyptis capitata* Jacq., *Hyptis lantanifolia* Poit., Porto Rico:—endemic.

6. **Irene irregularis** (Stevens) Toro, Mycologia **17**: 139. 1925.
*Meliola irregularis* Stevens, Ill. Biol. Monog. **2**[4]: 15. 1916.
On *Hygrophila brasiliensis* (Spreng.) Lindau., Porto Rico:—endemic.

7. **Irene Laguncullariae** (Earle) Toro, Mycologia **17**: 141. 1925.
*Meliola Laguncullariae* Earle, Muhlenbergia **1**: 11. 1901.
On *Laguncularia racemosa* (L.) Gaertn., Porto Rico:—endemic.

8. **Irene longipoda** (Gaill.) Toro, Mycologia **17**: 141. 1925.
*Meliola longipoda* Gaill. Bull. Soc. Myc. Fr. **8**: 178. 1892.
On *Cordia nitida* Vahl, *Varronia corymbosa* (L.) Desv., Porto Rico:—continental South America.

9. **Irene Melastomacearum** (Speg.) Toro, Mycologia **17**: 141. 1925.
*Meliola Melastomacearum* Speg. Biol. Acad. Ci. Cordoba **11**: 494. 1889.
On *Clidemia hirta* (L.) D. Don, *C. strigillosa* (Sw.) DC., *Miconia laevigata* (L.) DC., *Miconia prasina* (Sw.) DC., *M. impetiolaris* (Sw.) D. Don, *M. racemosa* (Aubl.) DC., Porto Rico:—continental South America.

10. **Irene Perseae** (Stevens) Toro, Mycologia **17**: 140. 1925.
*Meliola Perseae* Stevens, Ill. Biol. Monog. **2**[4]: 17. 1916.
On *Persea Persea* ( Cockerell, Porto Rico:—endemic.

11. **Irene portoricensis** ›ro, Mycologia **17**: 141. 1925.
On *Acnistus arborescens* 'L.) Schlecht., Porto Rico:—endemic.

12. **Irene seminata** (Berk. & Curt.) comb. nov.
*Meliola seminata* Berk. & Curt. Jour. Linn. Soc. **10**: 392. 1868.
*Meliola glabra* var. *Psychotriae* Stevens, Ill. Biol. Monog. **2**[4]: 14. 1916.
On *Tontanea herbacea* (Lam.) Standley [*Coccosipsilum repens* Sw.], *Psychotria Berteriana* DC., *Psychotria pubescens* Sw., Porto Rico:—Cuba.

13. **Irene sepulta** (Pat.) Toro, Mycologia **17**: 139. 1925.
*Meliola sepulta* Pat.; Stevens, Ill. Biol. Monog. **2**[4]: 14. 1916.
On *Avicennia nitida* Jacq., Porto Rico:—endemic.

14. **Irene triloba** (Wint.) Theiss. & Syd. Ann. Myc. **15**: 461. 1917.
*Meliola triloba* Winter, Hedwigia **25**: 95. 1886.
On *Pilea Parietaria* (L.) Bl., Porto Rico:—West Africa.

9. **MELIOLA** Fries, Syst. Orbis Veg. 111. 1825.

*Asteridium* (Speg.) Sacc. Syll. Fung. **9**: 435. 1891.

1. **Meliola ambigua** Pat. & Gaill. Bull. Soc. Myc. Fr. **4**: 104. 1888.

On *Lantana Camara* L., *L. involucrata* L., Porto Rico:—continental South America.

2. **Meliola amomicola** Stevens, Ill. Biol. Monog. **2**[4]: 40. 1916.

On *Amomis caryophyllata* (Jacq.) Krug & Urban, Porto Rico:—endemic.

3. **Meliola amphitricha** Fries, Elench. Fung. **2**: 109. 1828.

Reported on *Dendropanax arboreum* (L.) Dcne. & Pl. [*Aralia arborea* L.], reported by Lév. Ann. Sci. Nat. III. **3**: 64. Porto Rico:—Cuba; continental America; Australia; Philippine Islands.

4. **Meliola Andirae** Earle, Bull. N. Y. Bot. Garden **3**: 303. 1905

On *Andira inermis* H.B.K, Porto Rico:—endemic.

5. **Meliola bayamonensis** Tehon, Bot. Gaz. **67**: 506. 1919.

On *Psychotria pubescens* Sw., Porto Rico:—endemic.

6. **Meliola bicornis** Winter, Hedwigia **25**: 99. 1886.

On *Meibomia axillaris* (Sw.) Kuntze, *M. adscendens* (Sw.) Kuntze, *M. supina* (Sw.) Britton, *Securidaca volubilis* L., *Dolicholus reticulatus* (Sw.) Millsp., *Bradburya virginiana* (L.) Kuntze, *Mimosa Ceratonia* L., *Lonchocarpus glaucifolius* Urban, *Erythrina Poeppigiana* (Walp.) O. F. Cook [*Erythrina micropteryx* Poepp.], *Teramnus uncinatus* (L.) Sw., Porto Rico:—continental South America.

7. **Meliola bicornis** var. **Calopogonii** Stevens, Ill. Biol. Monog. **2**[4]: 64. 1916.

On *Calopogonium orthocarpum* Urban, Porto Rico:—variety endemic.

8. **Meliola bicornis** var. **Galactiae** Stevens, Ill. Biol. Monog. **2**[4]: 64. 1916.

On *Galactia dubia* DC., Porto Rico:—variety endemic.

9. **Meliola bidentata** Cooke, Grevillea **11**: 37. 1882.

On *Tabebuia pallida* Miers. [*Tecoma pentaphylla* Juss.], *Tabebuia haemantha* (Bert.) DC., Porto Rico:—continental North America.

10. **Meliola Byrsonimae** Stevens, Ill. Biol. Monog. **2**[4]: 49. 1916.

On *Byrsonima cuneata* (Tucz.) P. Wilson [*Byrsonima lucida* (Sw.) DC.], Porto Rico:—endemic.

11. **Meliola capsicola** Stevens, Ill. Biol. Monog. **2**[4]: 41. 1916.

On *Capsicum frutescens* L., Porto Rico:—endemic.

12. **Meliola Cestri** Tehon, Bot. Gaz. **67**: 505. 1919.

On *Cestrum* sp., Porto Rico:—endemic.

13. **Meliola Chamaecristae** Earle, Bull. N. Y. Bot. Garden **3**: 304. 1905.

On *Chamaecrista* sp., Porto Rico:—endemic.

14. **Meliola chamaecristicola** Stevens, Ill. Biol. Monog. **2**[4]: 26. 1916.

On *Chamaecrista granulata* (Urban) Britton, Mona Island:—endemic.

15. **Meliola Chiococcae** Stevens, Ill. Biol. Monog. **2**[4]: 27. 1916.

On *Chiococca alba* (L.) Hitchc., Porto Rico:—endemic.

16. **Meliola circinans** Earle, Bull. N. Y. Bot. Garden **3**: 304. 1905.

On *Mariscus jamaicensis* (Crantz) Britton, *Rynchospora corymbosa* (L.) Britton, *R. gigantea* Link, Porto Rico:—endemic.

17. **Meliola clavulata** Winter, Hedwigia **25**: 98. 1886.

On *Ipomoea Batatas* (L.) Lam., *I. cathartica* Poir., *I. tiliacea* (Willd.) Choisy, Porto Rico:—Africa.

18. **Meliola Clusiae** Stevens, Ill. Biol. Monog. **2**[4]: 52. 1916.

On *Clusia Gundlachii* Stahl, Porto Rico:—endemic.

19. **Meliola Comocladiae** Stevens, Ill. Biol. Monog. **2**[4]: 25. 1916.

On *Comocladia glabra* (Schultes) Spreng., *Spondias Mombin* L., Porto Rico:—endemic.

20. **Meliola compacta** Earle, Bull. N. Y. Bot. Garden **3**: 306. 1905.

On *Rhacoma Crossopetalum* L. [*Crossopetalum pallens* (Sm.) Kuntze], Porto Rico:—endemic.

21. **Meliola conferta** Tehon, Bot. Gaz. **67**: 502. 1919.

On *Rhacoma Crossopetalum* L., Mona Island:—endemic.

22. **Meliola contorta** Stevens, Ill. Biol. Monog. **2**[4]: 32. 1916.

On *Piper hispidum* Sw., Porto Rico:—endemic.

23. **Meliola Cucurbitacearum** Stevens, Ill. Biol. Monog. **2**[4]: 58. 1916.

On undetermined cucurbit, Porto Rico:—endemic.

24. **Meliola Cupaniae** Stevens, Ill. Biol. Monog. **2**[4]: 29. 1916.

On *Cupania americana* L., Porto Rico:—endemic.

25. **Meliola Cyperi** Pat.; Gaill. Le Genre Meliola 70. 1892.

On *Cyperus* sp., *Scleria* sp., *Mariscus jamaicensis* (Crantz) Britton, Porto Rico:—Africa.

According to Spegazzini specimens referred to this species belong to *Meliola argentina*.

26. **Meliola denticulata** Winter; Gaill. Le Genre Meliola 98. 1892.

On *Roystonea borinquena* Cook, Porto Rico:—continental South America.

27. **Meliola Didymopanicis** P. Henn. Hedwigia **34**: 106. 1895.

On *Dendropanax arboreum* (L.) Dcne. & Pl.; *D. laurifolium* (E. March.) Dcne. & Pl. [*Gilibertia laurifolia* E. March.], Porto Rico:—continental South America.

28. **Meliola Dieffenbachiae** Stevens, Ill. Biol. Monog. **2**[4]: 62. 1916.

On *Dieffenbachia seguine* (Jacq.) Schott, Porto Rico:—endemic.

29. **Meliola Dipholidis** Stevens, Ill. Biol. Monog. **2**[4]: 44. 1916.

On *Dipholis salicifolia* (L.) A. DC., Porto Rico:—endemic.

30. **Meliola Earlii** Stevens, Ill. Biol. Monog. **2**[4]: 47. 1916.

On *Pilea nummulariaefolia* (Sw.) Wedd., *P. Parietaria* (L.) Bl., Porto Rico:—endemic.

31. **Meliola furcata** Lév. Ann. Sci. Nat. Ill. **5**: 266. 1846.

On *Euterpe globosa* Gaertn. [*Acrista monticola* Cook], *Coccothrinax argentea* (Lodd.) Sargent, *Coccothrinax alta* (Cook) Becc., *Distictis lactiflora* (Vahl) Bur., *Thrinax microcarpa* Sarg. [*Thrinax Ponceana* Cook], Porto Rico:—continental South America.

32. **Meliola Gaillardiana** Stevens, Ill. Biol. Monog. **2**[4]: 61. 1916.

On *Piper aduncum* L., Porto Rico:—endemic.

33. **Meliola Gesneriae** Stevens, Ill. Biol. Monog. **2**[4]: 47. 1916.

On *Cestrum laurifolium* L'Her., *C. macrophyllum* Vent., *Pentarhaphia albiflora* Dcne., Porto Rico:—endemic.

34. **Meliola Guareae** Speg. Anal. Mus. Buenos Aires **23**: 42. 1912.

On *Guarea Guara* (Jacq.) P. Wilson [*Guarea trichilioides* L.], Porto Rico:—continental South America.

35. **Meliola guareicola** Stevens, Ill. Biol. Monog. **2**[4]: 53. 1916.

On *Guarea Guara* (Jacq.) P. Wilson [*Guarea trichilioides* L.], Porto Rico:—endemic.

36. **Meliola Guignardi** Gaill. Bull. Soc. Myc. Fr. **8**: 176. 1892.

On *Turpinia paniculata* Vent., Porto Rico:—continental South America.

37. **Meliola gymnanthicola** Stevens, Ill. Biol. Monog. **2**[4]: 49. 1916.

On *Gymnanthes lucida* Sw., Porto Rico:—endemic.

38. **Meliola Helleri** Earle, Bull. N. Y. Bot. Garden **3**: 307. 1905.

On *Eugenia monticola* (Sw.) DC., *E. Stahlii* (Kiaersk.) Krug & Urban, *Myrcia deflexa* (Poir.) DC., *M. splendens* (Sw.) DC.; also on unidentified woody plant, Porto Rico:—endemic.

39. **Meliola Hessii** Stevens, Ill. Biol. Monog. **2**[4]: 59. 1916.

On *Paullinia pinnata* L., Porto Rico:—endemic.

40. **Meliola Ipomoeae** Earle, Muhlenbergia **1**: 10. 1901.

On *Ipomoea cathartica* Poir., *I. Batatas* (L.) Lam., *I. tiliacea* (W.) Choisy, Porto Rico:—endemic.

41. **Meliola Jatrophae** Stevens, Ill. Biol. Monog. **2**[4]: 48. 1916.

On *Curcas hernandifolius* (Vent.) Britton [*Jatropha hernandifolia* Vent.], Porto Rico:—endemic.

42. **Meliola Lucumae** Stevens, Ill. Biol. Monog. **2**[4]: 49. 1916.

On *Lucuma multiflora* A. DC., Porto Rico:—endemic.

43. **Meliola Magnoliae** Stevens, Ill. Biol. Monog. **2**[4]: 55. 1916.

On *Magnolia portoricensis* Bello, Porto Rico:—endemic.

44. **Meliola Mangiferae** Earle, Bull. N. Y. Bot. Garden **3**: 307. 1905.

On *Mangifera indica* L., Porto Rico:—endemic.

45. **Meliola Marcgraviae** Tehon, Bot. Gaz. **67**: 506. 1919.

On *Marcgravia rectiflora* Tr. & Pl., Porto Rico:—endemic.

46. **Meliola maricaensis** Stevens, Ill. Biol. Monog. **2**[4]: 31. 1916.

On *Ilex nitida* (Vahl) Maxim, Porto Rico:—endemic.

47. **Meliola mayaguesiana** Stevens, Ill. Biol. Monog. **2**[4]: 32. 1916.

On *Palicourea crocea* (Sw.) R. & S., *P. domingensis* (Jacq.) DC., *P. riparia* Benth., Porto Rico:—endemic.

48. **Meliola Mayepeae** Stevens, Ill. Biol. Monog. **2**[4]: 48. 1916.

On *Mayepea domingensis* (Lam.) Krug & Urban, Porto Rico:—endemic.

49. **Meliola Merrillii** Sydow, Philippine Jour. Sci. **8**: 479. 1913.

On *Cissus sicyoides* L., Porto Rico:—Philippine Islands.

50. **Meliola Miconiae** Stevens, Ill. Biol. Monog. **2**[4]: 30. 1916.

On *Miconia prasina* (Sw.) DC., Porto Rico:—endemic.

51. **Meliola miconieicola** Stevens, Ill. Biol. Monog. **2**[4]: 23. 1916.

On *Miconia* sp., Porto Rico:—endemic.

52. **Meliola Molleriana** Winter, Hedwigia **25**: 98. 1886.

On *Sida urens* L., *Varronia* sp., Porto Rico:—Africa.

53. **Meliola monensis** Stevens, Ill. Biol. Monog. **2**[4]: 38. 1916.

On *Amyris elemifera* L., Mona Island:—endemic.

54. **Meliola Myrsinacearum** Stevens, Ill. Biol. Monog. **2**[4]: 40. 1916.

On *Icacorea guadalupensis* (Duch.) Britton, Myrsinaceae (indet.), Porto Rico:—endemic.

55. **Meliola nigra** Stevens, Ill. Biol. Monog. **2**[4]: 37. 1916.

On *Laguncularia racemosa* (L.) Gaertn., Porto Rico:—endemic.

56. **Meliola Ocoteae** Stevens, Ill. Biol. Monog. **2**[4]: 29. 1916.

On *Ocotea leucoxylon* (Sw.) Mez., Porto Rico:—endemic.

57. **Meliola ocoteicola** Stevens, Ill. Biol. Monog. **2**[4]: 45. 1916.

On *Ocotea leucoxylon* (Sw.) Mez., *Chrysophyllum* sp., Porto Rico:—endemic.

58. **Meliola Panici** Earle, Muhlenbergia **1**: 12. 1901.

On grasses, *Andropogon bicornis* L., *Ichnanthus pallens* (Sw.) Munro, *Lasiacis divaricata* (L.) Hitchc., *Olyra latifolia* L., *Oplismenus hirtellus* (L.) Beauv., *Panicum glutinosum* Sw., *Paspalum paniculatum* L., Porto Rico:—endemic.

59. **Meliola parathesicola** Stevens, Ill. Biol. Monog. **2**[4]: 24. 1916.

On *Parathesis serrulata* (Sw.) Mez., Porto Rico:—endemic.

60. **Meliola paucipes** Stevens, Ill. Biol. Monog. **2**[4]: 42. 1916.

On *Piper blattarum* Spreng., Porto Rico:—endemic.

61. **Meliola Paulliniae** Stevens, Ill. Biol. Monog. **2**[4]: 45. 1916.

On *Casearia arborea* (L. C. Rich.) Urban, *C. aculeata* Jacq., *C. guianensis* (Aubl.) Urban [*C. ramiflora* Vahl], *C. sylvestris* Sw., *Mammea americana* L., *Paullinia pinnata* L., Porto Rico:—endemic.

62. **Meliola perexigua** Gaill. Ec. Sup. Phar. Paris **1892**: 98.

On *Petiveria alliacea* L., Porto Rico:—continental South America.

63. **Meliola Philodendri** Stevens, Ill. Biol. Monog. **2**[4]: 60. 1916.

On *Philodendron Krebsii* Schott, Porto Rico:—endemic.

64. **Meliola Pilocarpi** Stevens, Ill. Biol. Monog. **2**[4]: 41. 1916.

On *Pilocarpus racemosus* Vahl, Porto Rico:—endemic.

65. **Meliola Piperis** Earle, Muhlenbergia **1**: 12. 1901.

On *Piper aduncum* L., Porto Rico:—endemic.

66. **Meliola praetervisa** Gaill. Le Genre Meliola 78. 1892.

On *Coccolobis pirifolia* Desf., *C. Sintenisii* Urban, *Cupania americana* L., Porto Rico:—Java.

67. **Meliola Psidii** Fries, Linnaea **5**: 549. 1830.

On *Psidium Guajava* L., Porto Rico:—continental South America.

68. **Meliola Psychotriae** Earle, Bull. N. Y. Bot. Garden **3**: 308. 1905.

On *Borreria laevis* (Lam.) Griseb., *B. ocimoides* (Burm. f.) DC., *Chiococcoa alba* (L.) Hitchc., *Erithalis fruticosa* L., *Duggena hirsuta* (Jacq.) Britton [*Gonzalagunia spicata* (Lam.) G. Maza], *Guettarda scabra* (L.) Lam., *Mitracarpus portoricensis* Urban, *Psychotria* sp., *Randia mitis* L. [*Randia aculeata* L.], Porto Rico:—endemic.

69. **Meliola pteridicola** Stevens, Ill. Biol. Monog. **2**[4]: 28. 1916.

On *Adiantum latifolium* Lam., *Anemia adiantifolia* (L.) Sw., Porto Rico:—endemic.

70. **Meliola quadrispina** Rac. Par. Algen Pilze Java's III. 33. 1900.

On *Ipomoea cathartica* Poir., Porto Rico:—Java.

71. **Meliola rectangularis** Stevens, Ill. Biol. Monog. **2**[4]: 27. 1916.

On *Banisteria laurifolia* L., *Coccolobis laurifolia* Jacq., Porto Rico:—endemic.

72. **Meliola Rudolphiae** Stevens, Ill. Biol. Monog. **2**[4]: 43. 1916.

On *Neorudolphia volubilis* (Willd.) Britton, Porto Rico:—endemic.

73. **Meliola Serjaniae** Stevens, Ill. Biol. Monog. **2**[4]: 44. 1916.

On *Serjania polyphylla* (L.) Radlk., Porto Rico:—endemic.

74. **Meliola Smilacis** Stevens, Ill. Biol. Monog. **2**[4]: 56. 1916.

On *Smilax coriacea* Spreng., Porto Rico:—endemic.

75. **Meliola Solani** Stevens, Ill. Biol. Monog. **2**[4]: 15. 1916.

On *Solanum jamaicense* Mill., Porto Rico:—endemic.

76. **Meliola Stenotaphri** Stevens, Ill. Biol. Monog. **2**[4]: 41. 1916.

On *Paspalum plicatulum* Michx., *Stenotaphrum secundatum* (Walt.) Kuntze, Porto Rico:—endemic.

77. **Meliola Tabernaemontanae** Speg. Anal. Mus. Buenos Ayres **23**: 42. 1912.

On *Plumiera Krugii* Urban, *Rauwolfia tetraphylla* L. [*Rauwolfia nitida* Jacq.], *Tabernaemontana oppositifolia* (Spreng.) Urban, Porto Rico:—continental South America.

78. **Meliola Tabernaemontanae** var. **Forsteroniae** Stevens, Ill. Biol. Monog. **2**[4]: 50. 1916.

On *Forsteronia corymbosa* (Jacq.) G. F. W. Mey., Porto Rico:—variety endemic.

79. **Meliola Tecomae** Stevens, Ill. Biol. Monog. **2**[4]: 53. 1916.

On *Tabebuia pallida* Miers [*Tecoma pentaphylla* Juss.], Porto Rico:—endemic.

80. **Meliola tenuissima** Stevens, Ill. Biol. Monog. **2**[4]: 24. 1916.

On *Gouania lupuloides* (L.) Urban, Porto Rico:—endemic.

81. **Meliola Thouiniae** Earle, Bull. N. Y. Bot. Garden **3**: 308. 1905.

On *Allophylus crassinervis* Radlk., *Cupania americana* L., *Krugiodendron ferreum* (Vahl) Urban, *Thyana* [*Thouinia*] *striata* (Radlk.) Britton, *Canella Winterana* (L.) Gaertn., Porto Rico:—endemic.

82. **Meliola tortuosa** Winter; Gaill. Le Genre Meliola 67. 1892.

On *Piper Amalago* L., *Pothomorphe peltata* (L.) Miq., Porto Rico:—continental South America.

83. **Meliola toruloidea** Stevens, Ill. Biol. Monog. **2**[4]: 25. 1916.

On *Chamaefistula antillana* Britton & Rose, *Inga laurina* L., *I. Inga* (L.) Britton, Porto Rico:—endemic.

84. **Meliola Triumfettae** Stevens, Ill. Biol. Monog. **2**[4]: 30. 1916.

On *Pariti tiliaceum* (L.) St. Hil. [*Hibiscus tiliaceus* L.], *Triumfetta semitriloba* Jacq., Porto Rico:—endemic.

10. **MELIOLIDIUM** Speg. Bol. Acad. Ci. Cordoba **26**: 336. 1923.

1. **Meliolidium portoricensis** Speg. Bol. Acad. Ci. Cordoba **26**: 336. 1923.

On *Calophyllum antillanum* Britton [*Calophyllum Calaba* Jacq. not L.], Porto Rico:—endemic.

11. **PARODIELLA** Speg. Anal. Soc. Ci. Argent. **9**: 178. 1880.

1. **Parodiella perisporioides** (Berk. & Curt.) Speg. Anal. Soc. Ci. Argent. **2**: 178. 1880.

*Dothidea perisporioides* Berk. & Curt. Grevillea **4**: 103. 1876.
*Dimerium grammodes* Garman, Mycologia **7**: 335. 1915.
*Myriosticta portoricensis* Pat.; Stevenson, Jour. Dept. Agric. Porto Rico **2**: 147. 1918.

On *Crotalaria retusa* L., *Meibomia barbata* (L.) Kuntze, *Meibomia scorpiurus* (Sw.) Kuntze, *Phaseolus lunatus* L., *Vigna repens* (L.) Kuntze; also reported by Stevenson on *Meibomia adscendens* (Sw.) Kuntze, *Phaseolus vulgaris* L., Porto Rico:—Jamaica; continental America; Europe; Asia.

12. **PARODIOPSIS** Maub.; Arnaud, Bull. Soc. Myc. Fr. **31**: 22. 1915.

1. **Parodiopsis melioloides** (Winter) Maubl. Bull. Soc. Myc. Fr. **31**: 23. 1915.

*Parodiella melioloides* Winter, Hedwigia **24**: 257. 1885.
*Sphaeria melioloides* Berk. & Curt. Jour. Linn. Soc. **10**: 387. 1868.
*Dimerosporium Urbanianum* P. Henn. Hedwigia **33**: 231. 1894.
*Dimerium melioloides* Garman, Mycologia **7**: 336. 1915.

On *Cedrela odorata* L., *Clusia Krugiana* Urban, Porto Rico:—Cuba; continental South America.

2. **Parodiopsis Stevensii** Arnaud, Ann. Epiphyties **9**: 22. 1923.

On *Inga Inga* (L.) Britton [*Inga vera* (Sw.) Willd.], Porto Rico:—endemic.

13. **PERISPORINA** P. Henn. Hedwigia **43**: 357. 1904.

1. **Perisporina Lantanae** Stevens, Trans. Ill. Acad. Sci. **10**: 170. 1917.

On *Lantana Camara* L., Porto Rico:—endemic.

2. **Perisporina Meliolae** (Stevens) Speg. Bol. Acad. Ci. Cordoba **26**: 339. 1923.

*Perisporium Meliolae* Stevens, Bot. Gaz. **65**: 228. 1918.

On *Meliola compositarum portoricensis* Stevens, on *Critonia portoricensis* (Urban) Britton & Wilson [*Eupatorium portoricense* Urban], Porto Rico:—endemic.

3. **Perisporina Paulliniae** (Stevens) Speg. Bol. Acad. Ci. Cordoba **26**: 339. 1923.

*Perisporium Paulliniae* Stevens. Bot. Gaz. **65**: 228. 1918.

On *Paullinia pinnata* L., Porto Rico:—endemic.

4. **Perisporina portoricensis** (Stevens) comb. nov.

*Perisporium portoricense* Stevens, Trans. Ill. Acad. Sci. **10**: 169. 1917.

On *Calophyllum antillanum* Britton [*Calophyllum Calaba* Jacq. not L.], Porto Rico:—endemic.

5. **Perisporina truncatum** (Stevens.) Arnaud, Ann. Epiphyties **9**: 33. 1923.

*Perisporium truncatum* Stevens, Trans. Ill. Acad. Sci. **10**: 167. 1917.

On *Inga laurina* (Sw.) Willd., Porto Rico:—endemic.

14. **PHAEODIMERIELLA** Theiss. Beih. Bot. Centr. **29**[12]: 46. 1912.

1. **Phaeodimeriella Cayaponiae** (Garman) comb. nov.

*Dimerosporium guarapiense* Speg. Anal. Soc. Ci. Argent. **17**: 130. 1884.

On *Cyperus*, Porto Rico:—continental South America.

According to Theiss. & Sydow l. c., *Dimerosporium appendiculatum* Earle, reported on *Asterina Sidae* on *Sida carpinifolia* L. f. is a synonym of the above.

2. **Phaeodimeriella guarapiensis** (Speg.) Theiss. Beih. Bot. Centr. **29**[12]: 68. 1912.

*Dimerium Cayaponiae* Garman, Mycologia **7**: 335. 1915.

On *Cayaponia americana* (Lam.) Cogn., Porto Rico:—endemic.

The perithecium has three to four short cylindrical, hook-like setae which are not mentioned in the original description; also the fungus is not parasitic on the leaves but on another fungus.

15. **STEVENSULA** Speg. Bol. Acad. Ci. Cordoba **26**: 339. 1923.

1. **Stevensula monensis** Speg. Bol. Acad. Ci. Cordoba **26**: 339. 1923.

On *Meliola monensis* on *Amyris elemifera* L., Porto Rico:—endemic.

16. **TRICHOMERIUM** Speg.

1. **Trichomerium portoricense** Speg. Bol. Acad. Ci. Cordoba **26**: 341. 1923.

On living leaves of *Psidium Guajava* L., Porto Rico:—endemic.

17. **WAGERIA** Stevens & Dalbey, Mycologia **11**: 7. 1919.

1. **Wageria portoricensis** Stevens & Dalbey, Mycologia **11**: 7. 1919.

On *Duggena hirsuta* (Jacq.) Britton [*Gonzalagunia spicata* (Lam.) G. Maza], Porto Rico:—endemic.

According to Spegazzini this species may have been based on imperfectly developed specimens of *Phaeodimeriella guarapiense* Speg.

## Family 3. **CAPNODIACEAE.**

1. **CAPNODIUM** Mont. Ann. Sci. Nat. III. **11**: 233. 1849.

1. **Capnodium Citri** (Pers.) Berk. & Desm. Jour. Royal Hort. Soc. **4**: 252. 1849.

*Fumago Citri* Pers. Myc. Eu. **1**: 9. 1822.

On *Citrus grandis* Osbeck [*Citrus decumana* L.], Porto Rico:—continental North America.

2. **Capnodium** sp.

On leaves of *Mangifera indica* L., St. Thomas:—

2. **PHAEOSACCARDINULA** P. Henn. Hedwigia **44**: 67. 1904.

*Limacinula* Sacc. Syll. Fung. **22**: 63. 1913.

1. **Phaeosaccardinula Seaveriana** Toro, Mycologia **17**: 145. 1925.

On *Erythrina glauca* Willd., Porto Rico:—endemic.

2. **Phaeosaccardinula tenuis** (Earle) comb. nov.

*Antennularia ? tenuis* Earle, Bull. N. Y. Bot. Garden **3**: 302. 1905.

On *Musa* sp., *Inga Inga* (L.) Britton [*Inga vera* (Sw.) Willd.], Porto Rico:—endemic.

3. **SEURATIA** Pat. Bull. Soc. Myc. Fr. **20**: 136. 1904.

1. **? Seuratia coffeicola** Pat. Bull. Soc. Myc. Fr. **20**: 136. 1904.

Reported on living leaves of *Psidium Guajava* by Spegazzini, Porto Rico:—Gambier.

The genus was believed by Höhnel to be the same as *Atichia* a genus of the Saccharomycetaceae.

4. **SORICA** Giesen. Ber. Deuts. Bot. Ges. **22**: 191. 1904.

1. **Sorica maxima** (Berk. & Curt.) Giesen. Ber. Deuts. Bot. Ges. **22**: 355. 1904.

*Capnodium maximum* Berk. & Curt. Jour. Linn. Soc. **10**: 391. 1868.
*Corynelia pteridicola* Stevens, Trans. Ill. Acad. Sci. **10**: 179. 1917.

On *Polypodium* sp., Porto Rico:—Cuba; Santo Domingo; continental South America.

5. **TRICHOTHYRIUM** Speg. Bol. Acad. Ci. Cordoba **11**: 555. 1889.

1. **Trichothyrium collapsum** (Earle) Theiss. Ann. Myc. **15**: 488. 1917.

*Pseudomeliola collapsa* Earle, Bull. N. Y. Bot. Garden **3**: 309. 1905.

On *Meliola* sp., on *Pothomorphe peltata* (L.) Miq., Porto Rico:—endemic.

2. **Trichothyrium dubiosum** (Bom. & Br.) Theiss. Beih. Bot. Cent. **32**[2]: 9. 1914.

*Asterina dubiosa* Bom. & Br. Bull. Soc. Bot. Belgium **32**: 157. 1896.

On *Irene Melastomacearum* (Speg.) Toro on *Clidemia hirta* (L.) D. Don, Porto Rico:—continental South America.

3. **Trichothyrium lomatophorum** (Ellis & Ev.) Toro, sp. nov.

*Asteridium lomatophorum* Ellis & Ev. (in herb.).

Spots circular, smoky-brown, 1–5 mm. in diameter, often confluent, then about 10 mm. across and angular; thyriothecia of radiate cellular structure, discoid, closely aggregate, superficial, dark, 50–320 $\mu$ in diameter; ostiolum minute, circular, about 3 $\mu$ in diameter; mycelium thickly appressed to the mycelium of the host, light brown, septate, about 2 $\mu$ thick; hyphae arranged side by side and originating from the same point at different places thus forming a series of fan-like structures; asci 8-spored, aparaphysate, clavate, short-stipitate; stipe 6–8 $\mu$ long, thick-walled, 20–30 $\times$ 12–15 $\mu$; spores inordinate, 1-septate, not constricted, 10–15 $\times$ 3–4.5 $\mu$, 1–2 guttulate hyaline.

Parasitic on the subiculum of *Meliola* sp. on *Pothomorphe peltata* (L.) Miq., Porto Rico Fungi (Heller) *142* Type.

## Order 6. CORYNELIALES.

The plants comprising this order are typically parasitic although one or two species usually placed here are saprophytes. The family Coryneliaceae is usually included with the Perisporiales or the Sphaeriales but according to Fitzpatrick (Mycologia **12**: 206–237) does not fit either order well and is here treated as a separate order.

### Family 1. CORYNELIACEAE.

1. **CORYNELIA** Ach.; Fries, Syst. Myc. **2**: 534. 1822.

1. **Corynelia portoricensis** (Stevens) Fitzp. Mycologia **12**: 259. 1920.

*Corynelia clavata* var. *portoricensis* Stevens, Trans. Ill. Acad. Sci. **10**: 178. 1917.

On *Nageia coriacea* (L. C. Rich.) Kuntze [*Podocarpus coriaceus* L. C. Rich.], Porto Rico:—endemic.

This was reported by Stevenson as *Corynelia creophila* (Speg.) Starb. So far as known the species of this genus attack only the one host genus and usually a given species of the fungus attacks only one host species.

## Order 7. PSEUDOPERISPORIALES.

Rafael A. Toro.

### Family 1. PSEUDOPERISPORIACEAE.

Aerial mycelium, colored, septate; perithecia superficial on the mycelium, ostiolate, parenchymatous, with or without appendages; asci globose or elongate, spores various; paraphyses present or absent.

The order differs from the Perisporiales in having perithecia with definite ostiolum.

1. **POROSTIGME** Syd. Ann. Myc. **15**: 202. 1917.

1. **Porostigme microspora** sp. nov.

Spots none; perithecia superficial, blackish, globose, 63–110 $\mu$ in diameter; ostiolate, parenchymatous, composed of indefinitely arranged globose to angular cells with dark cell-walls, ostiolum prominent, circular, 8–30 $\mu$ in diameter;

mycelium light brown, thickly interwoven with the mycelium of the host, septate, each cell about 10 $\mu$ long and 4 $\mu$ wide; asci aparaphysate, clavate, thick-walled, sessile, 8-spored, 44–52 $\times$ 8–10 $\mu$; spores inordinate, 1-septate, cells subequal, not constricted at septum, 8–10 $\times$ 4–5 $\mu$, light brown.

On *Meliola Panici* Earle, on *Panicum glutinosum* Sw. Herbarium University of Illinois, Porto Rico Fungi (Stevens) *6796*, (Type) Arecibo, Jan. 17, 1914.

This fungus has been referred to *Dimerium piceum* (Berk. & Curt.) Theiss. by Stevens (Bot. Gaz. **65**: 229). It is not a *Dimerium*, because the perithecia are ostiolate. It further differs from *D. piceum* in the absence of paraphyses and much smaller spores.

**PSEUDOPERISPORIUM** gen. nov.

Mycelium superficial, brownish, non-hyphopodiate; perithecia globose, membraneous, leathey, parenchymatous, setose; asci 8-spored; spores 4-celled, hyaline; paraphyses wanting.

The genus is related to *Dimeriella* Speg. from which it differs in the presence of ostiolum.

1. **Pseudoperisporium erigeronicola** (Stevens) comb. nov.

*Dimeriella erigeronicola* Stevens, Trans. Ill. Acad. Sci. **10**: 166. 1917.

On *Leptilon pusillum* (Nutt.) Britton, Porto Rico:—endemic.

Order 8. **HYPOCREALES.**

| | |
|---|---|
| Perithecia superficial, with or without stroma. | Fam. 1. NECTRIACEAE. |
| Perithecia immersed in a stroma. | Fam. 2. HYPOCREACEAE |

Family 1. **NECTRIACEAE.**

1. **CALONECTRIA** De-Not. Com. Critt. Ital. **2**: 477. 1867.

1. **Calonectria erubescens** (Rob.) Sacc. Michelia **1**: 309. 1878.

*Sphaeria erubescens* Rob.; Desm. Ann. Sci. Nat. III. **6**: 72. 1846.
*Nectria portoricensis* Stevens, Bot. Gaz. **65**: 231. 1918.

On the remains of *Meliola* on living leaves of various kinds, Porto Rico:—continental America; Trinidad.

The spores of the species are described as 1–3-septate. So far as the writer can judge, *Nectria portoricensis* Stevens has been described from immature material of the above or possibly the septation was overlooked.

2. **Calonectria gigaspora** Massee, Kew Bull. **1906**: 257.

On dead sugar cane, *Saccharum officinarum* L., Porto Rico:—Trinidad.

This species was originally described from Trinidad. The Porto Rican specimen has been compared with the type in the herbarium of the New York Botanical Garden, and found to agree.

3. **Calonectria melioloides** Speg. Anal. Soc. Ci. Argent. **19**: 41. 1886.

*Calonectria graminicola* Stevens, Bot. Gaz. **65**: 232. 1918.

On species of *Meliola* on living leaves, Porto Rico; Mona Island:—continental America. Specimens referred here should be *Subiculicola ambigua* Speg. and *Melioliphila graminicola* (Stev.) Speg.

4. **Calonectria ignota** Chardon, sp. nov.

Perithecia scattered, free and astromatic, dark orange, globose to subglobose, collapsed at the top and slightly pezizoid, smooth, with an ostiolum present; asci clavate to subclavate, 8-spored, 40–60 $\times$ 12–15 $\mu$; spores inordinate in the ascus, fusiform to subcylindric, 7–9-septate, with greenish contents, 22–26 $\times$ 4–6 $\mu$.

This species was determined in the herbarium as *Nectria episphaeria*, but a microscopical examination of it showed that the determination is incorrect. It possesses multiseptate spores, a character which makes it fall under *Calonectria*. In the treatment of the Hypocreales by Seaver (N. Am. Fl. **3**: 12–13. 1910), only three species of *Calonectria* are reported from North America. Our species differs from all three of them in the size and septation of the spores and also in the complete absence of a mycelium at the base of the perithecia.

On dead wood. Herbarium Insular Experiment Station (Stevenson & Rose) No. *6499*, Rio Piedras, June 18, 1917, Porto Rico:—endemic.

### 2. **CREONECTRIA** Seaver, Mycologia **1**: 183. 1909.

1. **Creonectria Bainii** (Massee) Seaver, N. Am. Fl. **3**: 22. 1910.

On pods of *Theobroma Cacao* L., Porto Rico:—Jamaica; Trinidad.

2. **Creonectria grammicospora** (Ferd. & Winge) Seaver, Mycologia **1**: 192. 1909.

*Nectria grammicospora* Ferd. & Winge, Bot. Tidssk. **29**: 11. 1908.

On dead bark of *Cajan Cajan* (L.) Millsp. [*Cajanus indicus* Spr.], Porto Rico; St. Thomas:—endemic.

3. **Creonectria Laurentiana** (Marchal) comb. nov.

*Nectria Laurentiana* Marchal, Bull. Soc. Belg. Micr. **20**: 259. 1894.

On *Saccharum officinarum* L., Porto Rico:—Africa.

This species has been reported by J. A. Stevenson on dead and dying cane stalks from various localities in Porto Rico. The species is said by its author to belong to the group Eu-Nectria which would place it in the genus *Creonectria* of the writers.

4. **Creonectria ochroleuca** (Schw.) Seaver, Mycologia **1**: 190. 1909.

*Sphaeria ochroleuca* Schw. Trans. Am. Phil. Soc. II. **4**: 204. 1852.
*Nectria vulgaris* Speg. Anal. Soc. Ci. Argent. **12**: 75. 1881.

On bark, Porto Rico; St. Thomas:—continental North America.

*Nectria vulgaris* which has been reported from St. Thomas is a synonym of *Creonectria ochroleuca*.

5. **Creonectria rubicarpa** (Cooke) Seaver, Mycologia **1**: 187. 1909.

*Nectria rubicarpa* Cooke, Grevillea **7**: 50. 1878.

This species has been reported from Porto Rico (Mycologia **13**: 285) but the material is scant and its identity, rather doubtful.

6. **Creonectria rubrosulphurea** Seaver, sp. nov.

Perithecia thickly congested, forming clusters about 4 mm. in diameter, each cluster containing few to many perithecia, the individual perithecia red, but covered with a beautiful coat of sulphur-yellow hairs; perithecial hairs, short, about 6–10 $\mu$ in diameter, several septate, blunt and often curved or hooked at the ends, minutely rough; asci clavate, 25–30 $\times$ 6–8 $\mu$; spores partially 2-seriate, narrow ellipsoid, 4–6 $\times$ 8–12 $\mu$, at maturity distinctly striate.

Type collected on dead cane, Rio Piedras, Feb. 3, 1914, J. R. Johnston *1346;* also on dead stick, *5696*, Porto Rico:—endemic.

In external appearance the species very closely resembles *Nectria flavociliata* to which name it was first referred. The plants, however, on closer examination are found to differ in the stromate character of the perithecia and the spores which are broader and distinctly striate. In this latter character it resembles *Nectria rhytidospora*.

7. **Creonectria macrospora** Chardon, sp. nov.

Perithecia in cespitose clusters, 2–3 mm. in diameter, densely crowded, surrounding a yellowish to orange colored stroma, the clusters containing 20–30 or more perithecia, individual perithecia large, 400–500 $\mu$ in diameter, dark red and possessing a brownish disk around the region of the ostiolum; asci clavate, 8-spored, 90–120 $\times$ 15–24 $\mu$; spores biseriate, seldom uniseriate above or below, oblique elliptical to subfuscoid, 1-septate, large, 21–29 $\times$ 9–11.5 $\mu$, hyaline, densely granular.

This interesting fungus has been referred to *Nectria Balansae* Speg. and published as a new combination under the genus *Creonectria*. Dr. Spegazzini has kindly supplied the author with a portion of the type of his species, from which the Porto Rican species seems to differ widely. The spores are much larger and the perithecia are provided with a conspicuous brown disk on which the ostiolum is centrally located. Furthermore, the perithecia never become pezizoid, while in *N. Balansae*, they are characteristically so. This last character, however, might be due to the old age of Spegazzini's material.

The species being essentially different from Spegazzini's and also from all the species of *Creonectria* given by Seaver from North America is given here as new. Prof. F. L. Stevens' No. *2965*, collected in Caracas, Venezuela, is also to be referred to this new form. The perithecia and spores are somewhat larger, but otherwise, the fungus agrees with the above description. The species possesses larger spores than any other *Creonectria* known from North America.

On dead wood. Herbarium Insular Experiment Station (Johnston) No. *4436*, Rio Piedras, June 16, 1912, a portion of which is deposited in Chardon's herbarium as No. *1274*, Porto Rico:—endemic.

3. **DEXTERIA** Stevens, Trans. Ill. Acad. Sci. **10:** 174. 1917.

1. **Dexteria pulchella** Stevens, Trans. Ill. Acad. Sci. **10:** 174. 1917.

Reported on *Paullinia pinnata* L., Porto Rico:—endemic.

This was made the type of a new genus which was said by its author to be closely related to *Calonectria* as would be indicated by the spore characters.

4. **BORINQUENIA** Stevens, Trans. Ill. Acad. Sci. **10:** 173. 1917.

1. **Borinquenia Miconiae** Stevens, Trans. Ill. Acad. Sci. **10:** 173. 1917.

On *Miconia laevigata* (L.) DC., Porto Rico:—endemic.

5. **GIBBERELLA** Sacc. Michelia **1:** 43. 1877.

1. **Giberella pulicaris** (Fries) Sacc. Michelia **1:** 43. 1877.

*Sphaeria pulicaris* Fries in Kunze & Schm. Myk. Hefte. **2:** 37. 1823.

On dead cane stalks and grass culms, Porto Rico:—North America; Europe; Africa; New Zealand.

6. **HYALOSPHAERIA** Stevens, Trans. Ill. Acad. Sci. **10:** 172. 1917.

1. **Hyalosphaeria Miconiae** Stevens, Trans. Ill. Acad. Sci. **10:** 172. 1917.

On *Miconia laevigata* (L.) DC., Porto Rico:—endemic.

This species is made the type of a new genus belonging to the Hypocreaceae.

7. **MACBRIDELLA** Seaver, Mycologia **1:** 195. 1909.

1. **Macbridella cinnabarina** Seaver, sp. nov.

Perithecia in dense clusters, 1–3 mm. in diameter, erumpent through the bark, cinnabar-red in mass, the individual perithecia covered with fine orange

granules, later becoming smooth and often dark colored; asci cylindric or subcylindric, 8-spored; spores obliquely 3-seriate, ellipsoid, with the ends slightly attenuated, constricted at the septum, pale brown, with distinct striations, usually containing two oil-drops, 6–7 × 34–16 μ.

On dead sticks, Porto Rico:—endemic.

Two collections of this species were made in Porto Rico during our recent collecting trip there. The species differs from *Macbridella striispora*, the only other species of the genus known from the island in the much smaller size of the spores as well as other points. Neither does it agree with any of the other species of this genus examined.

2. **Macbridella striispora** (Ellis & Ev.) Seaver, Mycologia **1**: 196. 1909.

*Nectria striispora* Ellis & Ev. Bull. Lab. Nat. Hist. State Univ. Iowa **2**: 398. 1893.

On bark, Porto Rico:—Central America; Trinidad.

8. **MEGALONECTRIA** Speg. Anal. Soc. Ci. Argent. **12**: 217. 1881.

1. **Megalonectria pseudotrichia** (Schw.) Speg. Anal. Soc. Ci. Argent. **12**: 217. 1881.

*Sphaeria pseudotrichia* Schw.; Berk. & Curt. Jour. Acad. Phila. II. **2**: 289. (as synonym) 1853.

On dead wood and bark, Porto Rico:—Jamaica; continental America; Ceylon; Philippine Islands.

9. **NECTRIA** Fries, Summa Veg. Scand. 387. 1849.

1. **Nectria Ananatis** sp. nov.

Perithecia rather sparingly scattered or occasionally in close contact but with no evidence of a stroma, pale yellow (in dried specimens); asci cylindric, 8-spored; spores fusoid, about 3 × 10μ.

Type collected by J. R. Johnston (*4519*), on leaves of pineapple, *Ananas Ananas* (L.) Cockerell, Rio Piedras, Aug. 7, 1912, Porto Rico:—endemic.

2. **Nectria confluens,** Seaver sp. nov.

Perithecia thickly gregarious and when coming into contact fusing together often forming confluent masses resembling a *Hypomyces*, bright red, covered with rusty granules, giving the whole mass a rust-red color; asci 8-spored, clavate, 60–75 × 10 μ; spores 1-seriate or 2-seriate at the upper end of the ascus, ellipsoid, attenuated at either end, 1-septate, scarcely constricted, at maturity delicately striated, about 5 × 12 μ.

Type collected by J. A. Stevenson (*3895*) on old pods of sword beans, Rio Piedras, Porto Rico:—endemic.

3. **Nectria episphaeria** (Tode) Fries, Summa. Veg. Scand. 388. 1849.

*Sphaeria episphaeria* Tode, Fungi Meckl. **2**: 21. 1791.

On dead wood, on or associated with old sphaeriaceous fungi, Porto Rico:—Cuba; Trinidad; continental America; Europe.

4. **Nectria meliolicola** Stevens, Bot. Gaz. **65**: 231. 1918.

Reported on *Meliola* on *Casearia sylvestris* Sw., *C. arborea* (L. C. Rich.) Urban, Porto Rico:—endemic.

5. **Nectria rhytidospora** Pat. Jour. de Bot. **3**: 343. 1889.

On bark, Porto Rico:—Martinique; Jamaica.

6. **Nectria suffulta** Berk. & Curt. Jour. Linn. Soc. **10**: 378. 1868.

*Nectria setosa* Ferd. & Winge, Bot. Tidssk. **29**: 11. 1908.

On dead stems of *Musa;* also on dead stems and leaves of undetermined herbaceous plants, Porto Rico; St. Thomas; St. Jan:—Cuba; Mexico.

10. **OPHIONECTRIA** Sacc. Michelia **1**: 323. 1878.

1. **Ophionectria Palicoureae** Seaver & Whetzel, sp. nov.

Perithecia hypophyllous, scattered, white to the naked eye, under the microscope yellowish or flesh-colored, covered over with a white floccose substance, reaching a diameter of about 300 $\mu$ opening with a wide ostiolum; asci cylindrical, slightly attenuated at the base, reaching a length of 100 $\mu$ and a diameter of 6 $\mu$; spores filiform nearly as long as the ascus, about 3 $\mu$ in diameter; paraphyses very slender, about 1 $\mu$ in diameter, branched, coiled and intertwined.

On living leaves of *Palicourea* sp., Porto Rico:—endemic.

Whetzel, Kern & Toro, No. *2682*—Cornell University Herb. *14743*.

2. **Ophionectria portoricensis** Chardon, Mycologia **13**: 285. 1921.

On a log, Porto Rico:—(Dominica ?).

This is thought by some students of fungi to be identical with *Calonectria ornata* A. L. Smith (Jour. Linn. Soc. **36**: 18. 1901), from Dominica. No authentic material of this species is available for comparison so the matter must remain in doubt.

11. **PARANECTRIA** Sacc. Michelia **1**: 317. 1878.

1. **Paranectria meliolicola** Stevens, Bot. Gaz. **65**: 232. 1918.

On *Meliola* on species of *Piper*, Porto Rico:—endemic.

2. **Paranectria Miconiae** Stevens, Bot. Gaz. **65**: 233. 1918.

On Microthyriaceous fungus on *Miconia*, Porto Rico:—endemic.

12. **PSEUDONECTRIA** Seaver, Mycologia **1**: 48. 1909.

1. **Pseudonectria pipericola** Stevens, Bot. Gaz. **65**: 230. 1918.

On *Meliola tortuosa* Winter, on *Piper marginatum* Jacq., Porto Rico:—endemic.

The species is said to be closely related to *Nectria mycetophila* Peck.

13. **SCOLECONECTRIA** Seaver, Mycologia **1**: 197. 1909.

1. **Scoleconectria coccicola** (Ellis & Ev.) Seaver, Mycologia **1**: 198. 1909.

*Nectria coccicola* Ellis & Ev. Jour. Myc. **2**: 39. 1886.

On scale insects on species of *Citrus*, Porto Rico:—Cuba; continental North America.

14. **SPHAERODERMATELLA** Seaver, Mycologia **1**: 182. 1909.

1. **Sphaerodermatella Helleri** (Earle) Seaver, Mycologia **1**: 182. 1909.

On bark of tree, Porto Rico:—endemic.

Fitzpatrick regards this as a *Tympanopsis*, a genus belonging to the Cucurbitariaceae.

15. **SPHAEROSTILBE** Tul. Fung. Carp. **1**: 130. 1861.

1. **Sphaerostilbe coccophila** (Desm.) Tul. Fung. Carp. **1**: 130. 1861.

*Microcera coccophila* Desm. Ann. Sci. Nat. III. **10**: 359. 1848.

On scale insects on species of *Citrus*, Porto Rico:—continental North America.

2. **Sphaerostilbe mammiformis** Chardon, sp. nov.

Stromata consisting of several slender stalks, 1–2 mm. high, of a pale orange color, with several globose heads (*Stilbum*); conidia ellipsoid, 1-septate, with hyaline, granular contents, 23–26 × 8–10 μ; perithecia in dense, cespitose clusters, following the crevices of the bark, 15–30 in each cluster, pale yellow, provided with a distinct red, mammiform ostiolum, the individual perithecia 500 μ in diameter, subglobose and not collapsing; asci cylindrical clavate, 8-spored, 90–100 × 12–15 μ; spores mostly biseriate, subfusoid, 1-septate, not constricted, 22–23 × 5–6 μ; provided with several greenish oil drops.

This species is characterized by the possession of a very conspicuous, mammiform ostiolum of a different color than the perithecia.

On dead bark, Cornell University Explorations of Porto Rico (Chardon No. *1270*, Maricao, Nov. 11, 1921), Porto Rico:—endemic.

16. **THYRONECTRIA** Sacc. Grevillea **4**: 21. 1875.

1. **Thyronectria megalosphora** (Speg.) comb. nov.

*Pleonectria megalospora* Speg. Anal. Soc. Ci. Argent. **12**: 82. 1881.

On dead and dying bark of *Cajan Cajan* (L.) Millsp. [*Cajanus indicus* Spreng.], Porto Rico:—South America.

This was apparently erroneously reported by Stevenson under the name of *Pleonectria megalonectria*.

Family 2. **HYPOCREACEAE.**

1. **BALANSIA** Speg. Anal. Soc. Ci. Argent. **19**: 45. 1885.

1. **Balansia Hypoxylon** (Peck) Atk. Jour. Myc. **11**: 254. 1905.

*Epichloe Hypoxylon* Peck, Ann. Rep. N. Y. State Mus. **27**: 108. 1875.

The only Porto Rican specimen referred to this species which has been seen is not a *Balansia* but a *Dothichloe*. Whether the true *Balansia Hypoxylon* occurs in Porto Rico is uncertain. It has been reported by Stevenson on *Panicum trichanthum* Nees, Porto Rico (?):—continental North America.

2. **CHROMOCREA** Seaver, Mycologia **2**: 58. 1910.

1. **Chromocrea gelatinosa** (Tode) Seaver, Mycologia **2**: 58. 1910.

*Sphaeria gelatinosa* Tode, Fungi Meckl. **2**: 48. 1791.

On dead cane stalks and debris, Porto Rico:—continental North America; Europe.

3. **CHROMOCREOPSIS** Seaver, Mycologia **2**: 63. 1910.

1. **Chromocreopsis striispora** Stevenson, Jour. Dept. Agr. Porto Rico **1**: 213. 1917.

On dead cane stalks, Porto Rico:—endemic.

4. **CORDYCEPS** (Fries) Link, Handb. **3**: 347. 1833.

1. **Cordyceps Barberi** Giard. Compt. Rend. Soc. Biol. Paris 1894: 823.

On larvae of *Diatraea saccharalis*, Porto Rico:—Barbados; Antigua.

This species has been recorded by Stevenson but apparently only the *Isaria* stage has been found.

2. **Cordyceps dipterigena** Berk. & Br. Jour. Linn. Soc. **14:** 111. 1875.

Reported on drosophalid flies, Porto Rico:—Ceylon.

3. **Cordyceps militaris** (L.) Link, Handb. **3:** 347. 1833.

*Clavaria militaris* L. Sp. Pl. 1182. 1753.

On pupa, Porto Rico:—widely distributed.

5. **HYPOCREA** Fries, Syst. Orbis Veg. 104. 1825.

1. **Hypocrea jecorina** Berk. & Br. Jour. Linn. Soc. **14:** 112. 1875.

On dead trunk of *Melia Azedarach* L., Porto Rico:—Ceylon.

Known in Porto Rico from only one collection made at the Insular Experiment Station.

2. **Hypocrea patella** Cooke & Peck; Peck, Ann. Rep. N. Y. State Mus. **29:** 57. 1878.

On dead wood, Porto Rico:—continental North America; Bermuda; Jamaica.

3. **Hypocrea rufa** (Pers.) Fries, Summa Veg. Scand. 383. 1849.

*Sphaeria rufa* Pers. Obs. Myc. **1:** 20. 1796.

On dead cane trash and dead wood, Porto Rico:—continental North America;

6. **HYPOCRELLA** Sacc. Michelia **1:** 322. 1878.

1. **Hypocrella cretacea** Höhn, Sitz.-ber. Akad. Wien **118:** 311. 1909.

On scale insects on living leaves, especially on ferns, Porto Rico:—Java.

2. **Hypocrella disjuncta** Seaver, Mycologia **12:** 97. 1920.

On white fly on *Batocydia Unguis* (L.) Mart. [*Bignonia Unguis* L.], Porto Rico:—Trinidad.

During a recent collecting trip in Porto Rico this species was found to be very abundant on the above plant host. No attempt was made to identify the insect host. It is possible that this fungus might be successfully used in checking the insect parasite.

3. **Hypocrella Tamoneae** Earle; Seaver, Mycologia **2:** 87. 1910.

On leaves of *Miconia* [*Tamonea*] sp., Porto Rico:—endemic.

This species is known only from the type collection in the herbarium of The New York Botanical Garden. From its superficial resemblance it has been confused with *Dothidina peribebuyensis* (Speg.) Chardon, which occurs on the same host genus. According to Toro this is *Polystigma nigroviride* Rehm.

4. **Hypocrella turbinata** (Berk.) Petch, Ann. Royal Bot. Gard. Perad. **5:** 535. 1914.

*Aschersonia turbinata* Berk. Ann. Mag. Nat. Hist. II. **9:** 199. 1852.

On scale insects, Porto Rico:—Santo Domingo; Trinidad; continental North America.

The conidial stage of this fungus is very common but the ascigerous stage is less frequently encountered.

7. **HYPOMYCES** (Fries) Tul. Ann. Sci. Nat. IV. **13:** 11. 1860.

1. **Hypomyces rosellus** (Albert. & Schw.) Tul. Ann. Sci. Nat. IV. **13:** 12. 1860.

*Sphaeria rosella* Albert. & Schw. Consp. Fung. 35. 1805.

On *Coriolopsis rigida* (Berk. & Mont.) Murrill, on rotten wood, Porto Rico; on tremellaceous fungus, St. Thomas:—Cuba; continental North America; Europe.

2. **Hypomyces** sp.

On old *Polyporus*, Porto Rico.
Collected by B. Fink. The spores are small and possibly not quite mature so that the identity of the species is uncertain.

8. **PODOSTROMA** Karst. Hedwigia **31**: 294. 1892.

1. **Podostroma brevipes** (Mont.) Seaver, Mycologia **2**: 61. 1910.

*Cordyceps brevipes* Mont. Syll. Crypt. 201. 1856.
On dead wood, Porto Rico:—continental America.

2. **Podostroma orbiculare** Chardon, Mycologia **13**: 286. 1921.

On decaying log, Porto Rico:—endemic.
Said to differ from other species in its woody stroma.

9. **STILBOCREA** Pat. Bull. Soc. Myc. Fr. **16**: 186. 1901.

1. **Stilbocrea hypocreoides** (Kalchbr. & Cooke) Seaver, Mycologia **2**: 62. 1910.

*Sphaerostilbe hypocreoides* Kalchbr. & Cooke, Grevillea **9**: 26. 1880.
*Sphaerostilbe intermedia* Ferd. & Winge, Bot. Tidssk. **29**: 12. 1908.
On dead wood, Porto Rico:—continental North America; Africa.
Chardon (Mycologia **13**: 286) regards *Stilbocrea intermedia* (Ferd. & Winge) Seaver as a possible synonym of this species which would extend its range to the Island of St. Thomas; St. Jan and Trinidad.

10. **SPERMOEDIA** Fries, Syst. Myc. **2**: 268. 1822.

1. **Spermoedia Stevensii** Seaver, Mycologia **3**: 222. 1911.

Reported on *Paspalum plicatulum* Michx., Porto Rico:—continental North America.

Species of Doubtful Relationship.

**GLAZIELLA** Berk. Vidensk. Medd. Nat. Dor. Kioben **1879-80**: 31.

**Glaziella aurantiaca** (Berk. & Curt.) Sacc. Syll. Fung. **2**: 582. 1883.

*Xylaria aurantiaca* Berk. & Curt. Jour. Linn. Soc. **10**: 382. 1868.
On dead wood, Porto Rico:—Jamaica; Santo Domingo; Trinidad; Mexico.

**USTILAGINOIDEA** Bref. Unters. Gesammt. Myk. **12**: 194. 1895.

**Ustilagionoidea usambarensis** P. Henn. in Engler. Bot. Jahr. **23**: 239. 1897.

On *Panicum laxum* Sw., Porto Rico:—Africa.

Order 9. **DOTHIDEALES.**

| | |
|---|---|
| Stromata superficial or becoming so. | Fam. 1. Dothideaceae. |
| Stromata formed under the cuticle and remaining covered. | Fam. 2. Phyllachoraceae. |

Family 1. **DOTHIDEACEAE.**

1. **DOTHICHLOE** Atk. Bull. Torrey Club **21**: 223. 1894.

1. **Dothichloe atramentosa** (Berk. & Curt.) Atk. Jour. Myc. **11**: 260. 1905.

*Hypocrea atramentosa* Berk. & Curt. Jour. Linn. Soc. **10**: 377. 1868.
On *Andropogon leucostachys* H. B. K., *Eustachys petraea* (Sw.) Desv. [*Chloris petraea* Sw.], Porto Rico:—continental North America.

2. **Dothichloe Aristidae** Atk. Bull. Torrey Club **21**: 224. 1894.

On *Aristida portoricensis* Pilger, Porto Rico:—southern United States.
Known only from a single collection in Porto Rico obtained at Mayaguez, Mar. 7, 1916, by Whetzel and Olive.

3. **Dothichloe subnodosa** (Atk.) Chardon, Mycologia **13**: 287. 1921.

*Balansia subnodosa* Atk.; Chardon, Mycologia **13**: 287. 1921.

On *Ichnanthus pallens* (Sw.) Munro, Porto Rico:—southern United States.
This species has been previously reported under the names *Dothichloe nigricans* and *Dothichloe Aristidae* but is now regarded as distinct from either.

2. **DOTHIDELLA** Speg. Anal. Soc. Ci. Argent. **9**: opp. 192; **10**: 21. 1880.

1. **Dothidella flava** Stevens, Bot. Gaz. **69**: 250. 1920.

On *Lithachne pauciflora* (Sw.) Beauv., Porto Rico:—endemic.

2. **Dothidella Parryi** (Farlow) Theiss. & Syd. Ann. Myc. **13**: 312. 1915.

*Endothia Parryi* Farlow; Cooke, Grevillea **13**: 102. 1884.

On *Agave sisalana* Perrine and *Furcraea tuberosa* Ait., Porto Rico:—south western United States.

3. **Dothidella portoricensis** Stevens, Bot. Gaz. **69**: 249. 1920.

On *Dicranopteris* [*Gleichenia* sp.], Porto Rico:—endemic.

3. **DOTHIDINA** Theiss. & Syd. Ann. Myc. **13**: 302. 1915.

1. **Dothidina palmicola** (Speg.) Theiss. & Syd. Ann. Myc. **13**: 304. 1915.

*Auerswaldia palmicola* Speg. Anal. Soc. Ci. Argent. **19**: 247. 1883.

On *Euterpe globosa* Gaertn., Porto Rico:—continental South America.

2. **Dothidina peribebuyensis** (Speg.) Chardon, Mycologia **13**: 289. 1922.

*Phyllachora peribebuyensis* Speg. Anal. Soc. Ci. Argent. **19**: 244. 1886.
*Auerswaldia Miconiae* P. Henn. Hedwigia **43**: 253. 1904.

On *Heterotrichum cymosum* (Wendl.) Urban, *Miconia laevigata* (L.) DC., *M. prasina* (Sw.) DC., *M. Sintenisii* Cogn., *Tetrazygia elaeagnoides* (Sw.) DC., Porto Rico:—continental South America.

4. **ULEODOTHIS** Theiss. & Syd. Ann. Myc. **13**: 305. 1915.

1. **Uleodothis Pteridis** Stevens, Bot. Gaz. **69**: 248. 1920.

On *Pteridium caudatum* (L.) Maxon, Porto Rico:—endemic.

## Family 2. PHYLLACHORACEAE.

1. **CATACAUMA** Theiss. & Syd. Ann. Myc. **12**: 280. 1914.

1. **Catacauma Myrciae** (Lév.) Theiss. & Syd. Ann. Myc. **13**: 393. 1915.

*Dothidea Myrciae* Lév., Ann. Sc. Nat. III. **5**: 264. 1846.
*Phyllachora Myrciae* Sacc. Syll. Fung. **2**: 597. 1883.

On *Myrcia citrifolia* (Aubl.) Urban [*Myrcia paniculata* (Jacq.) Krug & Urban], Porto Rico; Virgin Islands:—continental South America.

2. **Catacauma Ocoteae** Stevens, Bot. Gaz. **69**: 251. 1920.

On *Ocotea leucoxylon* (Sw.) Mez., Porto Rico:—endemic.

3. **Catacauma palmicola** Stevens, Bot. Gaz. **69**: 251. 1920.

On *Thrinax microcarpa* Sargent, Porto Rico:—endemic.

4. **Catacauma repens** (Corda) Theiss. & Syd. Ann. Myc. **13**: 383. 1915.

*Sphaeria repens* Corda, Ic. Fung. **4**: 142. 1840.

On *Ficus Stahlii* Warb., Porto Rico:—India.

5. **Catacauma Urbanianum** (Allesch. & P. Henn.) Theiss. & Syd. Ann. Myc. **13**: 394. 1915.

*Phyllachora Urbaniana* Allesch. & P. Henn. Hedwigia **36**: 236. 1897.

On *Calyptranthes Krugii* Kiaersk., Porto Rico:—continental South America.

2. **CATACAUMELLA** Theiss. & Syd. Ann. Myc. **13**: 400. 1915.

1. **Catacaumella Gouaniae** Stevens, Bot. Gaz. **69**: 252. 1920.

On *Gouania polygama* (Jacq.) Urban, *G. lupuloides* (L.) Urban, Porto Rico:—endemic.

3. **DIATRACTIUM** Syd. Ann. Myc. **18**: 183. 1920.

*Trabutiella* Stevens, Bot. Gaz. **70**: 401. 1920. Not *Trabutiella* Theiss. & Syd. Ann. Myc. **12**: 180. 1914.

1. **Diatractium Cordiae** (Stevens) Syd. l. c.

*Trabutiella Cordiae* Stevens, Bot. Gaz. **70**: 401. 1920.

On *Cordia glabra* L. [*Cordia Collococca* L.], Porto Rico:—endemic.

4. **ENDODOTHELLA** Theiss. & Syd. Ann. Myc. **13**: 582. 1915.

1. **Endodothella tetraspora** C. R. Orton, sp. nov.

Clypei black, amphigenous but most fully developed on upper leaf surface, scattered or sometimes confluent, 0.2–0.3 mm. wide by 0.5–1.0 mm. long, chiefly between the prominent leaf vines; fructification compound, the ascocarps chiefly in linear series, covered by the thick epiphyllous clypeus; ascocarps vertically compressed, often fan-shaped, 120–200 $\mu$ wide by 80–120 $\mu$ high, walls thick; asci chiefly cylindrical, sometimes narrowly ellipsoid 10–12 $\times$ 65–80 $\mu$, walls thin, fragile; 4 ascospores, uniseriate, at first one-celled becoming septate toward maturity, narrowly ovoid, usually attenuated below, 6–8 $\times$ 20–26 $\mu$, wall colorless; paraphyses filiform, much longer than the asci.

Like *Phyllachora* in appearance but ascospores 2-celled on maturity. Further characterized by the 4-spored ascus.

On *Andropogon bicornis* L.—El Yunque. Type collected on El Yunque, April 14, 1916. (Whetzel & Olive *449*), Porto Rico:—endemic.

5. **ENGLERODOTHIS** Theiss. & Syd. Ann. Myc. **13**: 285. 1915.

1. **Englerodothis kilimandscharica** (P. Henn.) Theiss. & Syd. Ann. Myc. **13**: 285. 1915.

*Cocconia kilimandscharica* P. Henn. in Engler, Pfl. Ost-Afr. **5**: 31. 1895.

? *Phyllachora Mayepeae* Stevens & Dalbey, Bot. Gaz. **68**: 56. 1919.

On *Mayepea domingensis* (Lam.) Krug & Urban, Porto Rico:—East Africa.

6. **MYRIOGENOSPORA** Atk. Bull. Torrey Club **21**: 225. 1894.

1. **Myriogenospora Bresadoleana** P. Henn. Hedwigia **41**: 9. 1902.

On *Andropogon bicornis* L., *Axonopus compressus* (Sw.) Beauv., *Ichnanthus pallens* (Sw.) Munro, *Paspalum conjugatum* Berg., Porto Rico:—continental South America.

2. **Myriogenospora Paspali** Atk. Bull. Torrey Club **21**: 225. 1894.

On *Paspalum conjugatum* Berg., Porto Rico:—continental North America.

7. **PHYLLACHORA** Nitschke, Fuckel, Symb. Myc. 216. 1869.

1. **Phyllachora Acaciae** P. Henn. Hedwigia **33**: 233. 1894.

*Phyllachora texana* Tharp, Mycologia **9**: 118. 1917.

On *Vachellia Farnesiana* (L.) Wight & Arn., Porto Rico:—Cuba; Bahama; continental North America.

2. **Phyllachora acuminata** Starb. Arkiv. Bot. $5^2$: 11. 1905.

On *Paspalum* sp., Porto Rico:—continental South America.

3. **Phyllachora Andropogonis** (Schw.) Karst. & Hariot, Rev. Myc. **12**: 172. 1890.

? *Sphaeria Andropogonis* Schw. Trans. Am. Phil. Soc. II. **4**: 209. 1832.

Reported from Porto Rico on *Paspalum millegrana* Schrad. but the determination of the fungus is doubtful. Orton thinks that the species reported under this name should be referred to some other name.

4. **Phyllachora assimilis** Theiss. & Syd. Ann. Myc. **13**: 439. 1915.

On *Schizachyrium brevifolium* (Sw.) Nees [*Andropogon brevifolius* Sw.], Porto Rico:—Himalaya.

5. **Phyllachora Banisteriae** Stevens & Dalbey, Bot. Gaz. **68**: 54. 1919.

On *Stigmaphyllon tomentosum* (Desf.) Ndz. [*Banisteria tomentosa* Desf.], Porto Rico:—endemic.

6. **Phyllachora Bourreriae** Stevens & Dalbey, Bot. Gaz. **68**: 54. 1919.

On *Bourreria succulenta* Jacq., Porto Rico:—endemic.

7. **Phyllachora Canafistulae** Stevens & Dalbey, Bot. Gaz. **68**: 55. 1919.

On *Cassia fistula* L., *C. grandis* L. f., Porto Rico:—Santo Domingo.
Formerly reported as *Phyllachora Cassiae* P. Henn., by Stevenson.

8. **Phyllachora Chardoni** C. R. Orton, sp. nov.

Clypei black, chiefly epiphyllous, scattered, 0.2–0.3 mm. wide × 0.3–0.5 mm. long; fructification simple or compound, the ascocarps vertically flattened, 160–260$\mu$ wide × 80–120$\mu$ high; asci ellipsoid, 12–22 × 65–110 $\mu$; 8 ascospores, usually biseriate, rarely uniseriate in arrangement, ellipsoid, 6.5–7.5 × 11–14$\mu$; wall colorless; paraphyses filiform, much longer than the asci.

Distinguished from *Phyllachora puncta* (Schw.) Orton by the smaller clypei and the biseriate arrangement of ascospores which are also larger; from *Phyllachora congruens* Rehm, by the longer asci and broader ascospores. Named in honor of the Commissioner of Agriculture of Porto Rico.

On Poaceae: *Panicum geminatum* Forsk.

Type locality: Mayaguez, July 15, 1920, C. E. Chardon *912*. Porto Rico:—endemic.

9. **Phyllachora cornuospora** Atk. Bull. Cornell Univ. **3**: 11. 1897.

On *Paspalum virgatum* L., Porto Rico:—continental North America.

10. **Phyllachora Cyperi** Rehm in Thüm. Contr. Fl. Myc. Lus. No. *282*.
On *Cyperus giganteus* Vahl, Porto Rico:—Europe.

11. **Phyllachora drypeticola** Stevens & Dalbey, Bot. Gaz. **68:** 55. 1919.
On *Drypetes lateriflora* (Sw.) Krug & Urban, Porto Rico:—Europe.

12. **Phyllachora Engleri** Speg. Anal. Soc. Ci. Argent. **19:** 96. 1885.
On *Anthurium scandens* (Aubl.) Engler, Porto Rico:—Jamaica; Cuba; Guatemala; Trinidad; continental South America.

13. **Phyllachora Eriochloae** Speg. Anal. Mus. Nac. Buenos Aires **19:** 416. 1909.
On *Paspalum conjugatum* Berg., *Valota insularis* (L.) Chase, Porto Rico:—continental South America.

14. **Phyllachora fusicarpa** Seaver in Britton, Bahama Fl. 633. 1920.
On *Duranta repens* L., Porto Rico:—Bahamas.

15. **Phyllachora Galactiae** Earle; Seaver in Britton, Bahama Fl. 633.
On *Galactia striata* (Jacq.) Urban, Porto Rico:—Bahamas.

16. **Phyllachora Genipae** Stevens & Dalbey, Bot. Gaz. **68:** 55. 1919.
On *Genipa americana* L., Porto Rico:—endemic.

17. **Phyllachora Graminis** (Pers.) Fuckel, Symb. Myc. 216. 1869.
*Sphaeria Graminis* Pers. Obs. Myc. **1:** 18. 1796.
Reported from Porto Rico on various grasses but the determination of the fungus is doubtful.

18. **Phyllachora gratissima** Rehm, Hedwigia **31:** 306. 1892.
On *Persea Persea* (L.) Cockerell, Porto Rico:—continental South America.

19. **Phyllachora Heterotrichi** Stevens & Dalbey, Bot. Gaz. **68:** 56. 1919.
On *Heterotrichum cymosum* (Wendl.) Urban, Porto Rico:—endemic.

20. **Phyllachora inclusa** (Berk. & Curt.) Sacc. Syll. Fung. **3:** 599. 1883.
*Dothidea inclusa* Berk. & Curt. Proc. Am. Acad. Arts & Sci. **4:** 129. 1860.
On *Jacquinia Berterii* Spreng., Porto Rico:—Nicaragua.

21. **Phyllachora Lathyri** (Lév.) Theiss. & Syd. Ann. Myc. **13:** 501. 1915.
*Dothidea Lathyri* Lév. Demidoff Voyage **2:** 106. 1915.
On *Bradburya virginiana* (L.) Kuntze, Porto Rico:—Europe; Asia.

22. **Phyllachora luteo-maculata** (Schw.) Orton; Stevenson, Jour. Dept. Agr. Porto Rico **2:** 152. 1918.
*Sphaeria luteo-maculata* Schw. Trans. Am. Phil. Soc. II. **4:** 209. 1832.
On *Andropogon leucostachys* H.B.K., Porto Rico:—continental North America.

23. **Phyllachora Maydis** Maubl. Bull. Soc. Myc. Fr. **20:** 72. 1904.
On *Zea Mays* L., Porto Rico:—continental North America.

24. **Phyllachora Metastelmae** Stevens & Dalbey, Bot. Gaz. **68:** 57. 1919.

On *Metastelma* sp., Porto Rico:—endemic.

25. **Phyllachora Massinii** Toro, sp. nov.

Spots amphigenous, purplish, slightly exceeding the stroma, often confluent, irregular; stromata small, black, shining, visible on both sides of the leaf but prominent on the upper surface, occupying the mesophyll, 1–2 mm. in diameter, plurilocular; locules globose, 182–235 × 160–200 μ; asci cylindrical, 8-spored, 76–100 × 10–14 μ; spores obliquely uniseriate, ellipsoidal, hyaline, continuous, 13–17 × 5–7 μ; paraphyses filiform.

On *Brunellia comocladifolia* H. & B. Expl. of P. R. (W. K. & T. *2482*) Type. Yuaco, June 16, 1924.

On same leaf with *Asterina Kernii* Toro.

26. **Phyllachora minuta** P. Henn. Hedwigia **41:** 143. 1902.

On *Pariti tiliaceum* (L.) St. Hil. [*Hibiscus tiliaceus* L.], Porto Rico:—Java; Philippines; Australia.

27. **Phyllachora Nectandrae** Stevens & Dalbey, Bot. Gaz. **68:** 57. 1919.

On *Nectandra patens* (Sw.) Griseb., Porto Rico:—endemic.

28. **Phyllachora nitens** Garman, Mycologia **7:** 339. 1915.

On *Schlegelia portoricensis* (Urban) Britton (Erroneously reported as *Schlegelia brachyantha* Griseb.), Porto Rico:—endemic.

29. **Phyllachora ocoteicola** Stevens & Dalbey, Bot. Gaz. **68:** 57. 1919.

On *Ocotea leucoxylon* (Sw.) Mez., Porto Rico:—endemic.

30. **Phyllachora perforans** (Rehm) Sacc. & Syd. in Sacc. Syll. Fung. **16:** 619. 1902.

*Phyllachora dalbergiicola* var. *perforans* Rehm, Hedwigia **39:** 232. 1900.

On *Elsota virgata* (Sw.) Kuntze [*Securidaca virgata* Sw.], Porto Rico:—continental South America.

31. **Phyllachora Phaseoli** (P. Henn.) Theiss. & Syd. Ann. Myc. **13:** 507. 1915.

*Physalospora Phaseoli* P. Henn. Hedwigia **43:** 368. 1904.

*Hyponectria Phaseoli* Stevens, Bot. Gaz. **70:** 401. 1920.

On *Vigna vexillata* (L.) A. Rich., Porto Rico:—continental South America. Conidial stage *Zythia Phaseoli* Stevens.

32. **Phyllachora puncta** (Schw.) Orton; Stevenson, Jour. Dept. Agr. Porto Rico **2:** 153. 1918.

*Sphaeria punctum* Schw. Trans. Am. Phil. Soc. II. **4:** 209. 1832.

On *Oplismenus hirtellus* (L.) Beauv., *O. setarius* R. & S., Porto Rico:—continental South America.

33. **Phyllachora quadraspora** Tehon, Bot. Gaz. **67:** 507. 1919.

On *Paspalum glabrum* Poir, *P. conjugatum* Berg., Porto Rico:—endemic.

34. **Phyllachora Renealmiae** Rehm, Hedwigia **36:** 383. 1897.

On *Alpinia antillarum* R. & S., Porto Rico:—continental South America.

35. **Phyllachora Roureae** Syd. Philippine Jour. Sci. **8**: 277. 1913.

On *Rourea surinamensis* Miq. [*Rourea glabra* Griseb. Not H. B. K.], Porto Rico:—Philippines.

36. **Phyllachora Scleriae** Rehm, Hedwigia **39**: 232. 1900.

On *Scleria pterota* Presl., Porto Rico:—continental South America.

37. **Phyllachora Securidacae** P. Henn. Hedwigia **43**: 251. 1904.

On *Elsota virgata* (Sw.) Kuntze, Porto Rico:—continental South America.

38. **Phyllachora serjaniicola** Chardon, Mycologia **13**: 293. 1921.

On *Serjania polyphylla* (L.) Radlk., Porto Rico.—endemic.

39. **Phyllachora simplex** Starb. Arkiv. Bot. $5^{15}$: 14. 1905.

On *Coccolobis laurifolia* Jacq., Mona Island:—continental South America.

40. **Phyllachora smilacicola** Chardon, sp. nov.

Stromata amphigenous, black, globose or slightly angular, 2–3 mm. in diameter, plurilocular, occupying the mesophyll of the leaf; loculi ovate or somewhat flattened, 400–500 × 200–250 μ in diameter; asci elliptical clavate, 75–90 × 15–18 μ, 8-spored; spores uniseriate above, biseriate in the main body of the ascus, somewhat fusiform or irregularly fusoid, provided with a small appendage at each end, hyalina, the mature spores 16.5–20 × 6.5–8 μ; paraphyses present.

Arthur, in Mycologia **9**: 77, records a rust under this number (W. & O. *348*) as *Puccinia Smilacis* Schw. Our specimen is a part of this collection, being the leaves showing the *Phyllachora* and now separated out as *348b*.

On *Smilax domingensis* Willd. Whetzel & Olive *348b*. Maricao, Mar. 16, 1916.

41. **Phyllachora sphaerosperma** Winter, Hedwigia **23**: 170. 1884.

On *Cenchrus echinatus* L., Porto Rico; *C. myosurioides* (Sw.) Nash, Mona Island:—continental South America.

42. **Phyllachora Taruma** Speg. Anal. Soc. Ci. Argent. **19**: 94. 1886.

On *Vitex divaricata* Sw., Porto Rico:—continental South America.

43. **Phyllachora Tragiae** (Berk. & Curt.) Sacc. Syll. Fung. **2**: 601. 1883.

*Dothidea Tragiae* Schw.; Berk. & Curt. Jour. Acad. Nat. Sci. II. **2**: 288. 1853.

On *Croton lucidus* L., Porto Rico:—continental South America.

44. **Phyllachora viequesensis** Orton & Toro, sp. nov.

Stromata amphigenous, black, not shining, scattered, rarely confluent, irregular or occasionally circular, 0.5–1 mm. wide, 0.5–2 mm. long, mostly uniloculate, sometimes 2-loculate; locules globose or irregular, 160–220 μ long, 180–200 μ wide; clypeus mostly epiphyllous, 60–80 μ diam.; asci cylindrical, 8-spored, 110–112 × 10–12 μ, with a pedicel 10 μ long; spores obliquely uniseriate, fusiform or subfusiform, 16–20 × 6–8 μ, continuous, hyaline; paraphyses filiform.

On *Cyperus ligularis* L. Cornell University Explorations of Porto Rico (Whetzel, Kern & Toro, *2648* type). Vieques, July 17, 1925.

This fungus is unique for several reasons. The stromata are formed in the upper portions of the big air cavities of the host leaves. From the base of each stroma a compact weft of brown mycelial hyphae arise and penetrate the host

cells below the cavities. In this respect it resembles *Phyllachora Thwaitesii* (Berk.) Sacc. The generic position of the fungus is also questionable. Possessing mostly uniloculate stromata it is difficult to decide whether we are dealing with a Dothideaceous or a Sphaeriaceous fungus. However, since most of the Phyllachoras on grasses are of this type the fungus is placed in this genus for the present. It also suggests *Puiggarina* Speg. a genus which has been established for uniloculate species of *Phyllachora* devoid of paraphyses. Our species, however, has paraphyses and it will necessitate the establishment of a new genus.

45. **Phyllachora Whetzelii** Chardon, Mycologia **13**: 293. 1921.

On *Eugenia* sp., Porto Rico:—endemic.

46. **Phyllachora Zanthoxyli** Winter; Rab.-Wint. Fungi Eur. *3558*. 1886.

On *Zanthoxylum martinicense* (Lam.) DC., Porto Rico:—continental South America.

8. **PHAEODOTHIOPSIS** Theiss. & Syd. Ann. Myc. **13**: 410. 1915.

1. **Phaeodothiopsis Eupatorii** Stevens, Bot. Gaz. **69**: 252. 1920.

On *Critonia portoricensis* (Urban) Britton & P. Wilson [*Eupatorium portoricense* Urban], Porto Rico:—endemic.

9. **SCIRRHIA** Nitschke; Fuckel, Symb. Myc. 220. 1869.

1. **Scirrhia lophodermioides** Ellis & Ev. Bull. Torrey Club **22**: 435. 1895.

On *Saccharum officinarum* L., Porto Rico:—Sandwich Island.

10. **TRABUTIA** Sacc. & Roum. Rev. Myc. **3**: 27. 1881.

1. **Trabutia Bucidae** Chardon, Mycologia **13**: 290. 1921.

On *Bucida Buceras* L., Porto Rico:—endemic.
Known only from a single collection near Coamo.

2. **Trabutia conica** Chardon, Mycologia **13**: 292. 1921.

On *Drepanocarpus lunatus* (L. f.) Mey., Porto Rico; Vieques:—endemic.

3. **Trabutia Guazumae** Chardon, Mycologia **13**: 291. 1921.

? *Phyllachora Guazumae* P. Henn. Hedwigia **48**: 7. 1909.

On *Guazuma Guazuma* (L.) Cockerell [*Guazuma ulmifolia* Lam.], Porto Rico: —Cuba.

4. **Trabutia Randiae** (Rehm) Theiss. & Syd. Ann. Myc. **13**: 351. 1915.

*Phyllachora Randiae* Rehm, Hedwigia **36**: 371. 1897.

On *Randia* sp., St. Jan; Porto Rico:—continental South America.

5. **Trabutia Zanthoxylii** Chardon, sp. nov.

Spots irregular or roughly circular, appearing as discolored patches on both surfaces of the leaf; stromata numerous, black, not shining, epiphyllous, circular at first, later confluent and fusing into a large, irregular stroma, subcuticular; locules single, 250–400 × 100–150 μ; asci oblong-cylindrical, 8-spored, 80–100 × 15–22 μ; spores uniseriate or partially biseriate, ellipsoidal, continuous, hyaline, 12–14 × 6–7 μ; paraphyses present.

This species is characterized by the possession of a very irregular, confluent, black stroma on the upper surface of the leaves. It is a true *Trabutia* since its stroma is located between the cuticle and the epidermis.

On *Zanthoxylum martinicense* (Lam.) DC. Cornell University Explorations of Porto Rico (Whetzel & Olive *649*, Apr. 19, 1916 type). Porto Rico:—endemic.

11. **TRABUTIELLA** Theiss. & Syd. Ann. Myc. **12**: 180. 1914. Not Stevens, Bot. Gaz. **70**: 401. 1920.

1. **Trabutiella Ichnanthi** (Speg.) comb. nov.

*Puiggarina Ichnanthi* Speg. Bot. Acad. Ci. Cordoba **26**: 356. 1923.

On *Ichnanthus pallens* (Sw.) Munro, Porto Rico:—endemic.

## Order 10. FIMETARIALES.

Perithecia overtopped with a dense mass of hairs; asci and paraphyses evanescent. Fam. 1. CHAETOMIACEAE.

Perithecia not overtopped with hairs; asci and paraphyses persistent but delicate. Fam. 2. FIMETARIACEAE.

### Family 1. CHAETOMIACEAE.

1. **CHAETOMIUM** Kunze & Schm. Myk. Hefte **1**: 15. 1817.

1. **Chaetomium globosum** Kunze & Schm. Myk. Hefte **1**: 15. 1817.

On filter paper, Porto Rico:—widely distributed.

### Family 2. FIMETARIACEAE.

1. **SPORORMIA** De-Not. Mem. Acad. Torino II. **10**: 342. 1849.

1. **Sporormia minima** Auersw. Hedwigia **7**: 66. 1868.

On cow dung, Porto Rico:—continental America; Europe.

2. **Sporormia intermedia** Auersw. Hedwigia **7**: 67. 1868.

On donkey dung, St. Thomas:—continental America; Europe.

2. **FIMETARIA** Griff. & Seaver, N. Am. Fl. **3**: 65. 1910.

1. **Fimetaria fimicola** (Rob.) Griff. & Seaver, N. Am. Fl. **3**: 66. 1910.

*Sordaria fimicola* Ces. & De-Not. Comm. Critt. Ital. **1**: 266. 1863.

On guinea pig dung, Porto Rico:—continental North America; Europe.

2. **Fimetaria humana** (Fuckel, Griff. & Seaver, N. Am. Fl. **3**: 67. 1910.

*Sphaeria humana* Fuckel, Fungi Rhen. *1801*. 1866.

On human dung, Porto Rico:—continental North America; Europe.

3. **PLEURAGE** Fries, Summa Veg. Scand. *418*. 1849.

1. **Pleurage arachnoidea** (Niessl, D. Griff. Mem. Torrey Club 11: 73. 1901.

*Podospora arachnoidea* Niessl; Krieger, Fungi Sax. *371*. 1888.

On cow dung, Porto Rico:—continental North America; Europe.

## Order 11. SPHAERIALES.

| | |
|---|---|
| Stroma wanting; perithecia free or immersed in the substratum. | |
| Perithecia free or nearly so. | |
| Superficial or nearly so, the bases occasionally slightly imbedded. | Fam. 1. Sphaeriaceae. |
| Partially immersed in the substratum. | Fam. 2. Amphisphaeriaceae. |
| Perithecia entirely immersed in the substratum, with only the necks protruding. | |
| Asci thickened at apex; necks of perithecia beak-like. | |
| Without clypeus. | Fam. 3. Gnomoniaceae. |
| With clypeus. | Fam. 4. Clypeosphaeriaceae. |
| Asci not thickened at apex; necks of perithecia short. | |
| Paraphyses absent; asci united in fascicles. | Fam. 5. Mycosphaerellaceae. |
| Paraphyses present; asci free. | Fam. 6. Pleosporaceae. |
| Stroma present. | |
| Perithecia superficial on stroma. | Fam. 7. Cucurbitariaceae. |
| Perithecia immersed in the stroma. | |
| Stroma immersed in the host tissues. | |
| Conidia in cavities in the stroma. | Fam. 8. Valsaceae. |
| Conidia formed in layers. | Fam. 9. Melanconidaceae. |
| Stroma erumpent or entirely superficial. | |
| Ascospores simple or septate. | |
| Usually allantoid. | Fam. 10. Diatrypaceae. |
| Not usually allantoid. | |
| Conidia in cavities. | Fam. 11. Melogrammataceae. |
| Conidia in layers on surface of stroma. | Fam. 12. Xylariaceae. |

## Family 1. SPHAERIACEAE.

### 1. BERTIA De-Not. Giorn. Bot. Ital. 1: 335. 1844.

**1. Bertia moriformis** (Tode) De-Not. Giorn. Bot. Ital. **1**: 335. 1844.

This is based on a single collection made by Heller which I have examined microscopically. It is not *Bertia moriformis* but *Thaxteria leptosporioides.*

### 2. HERPOTRICHIA Fuckel, Symb. Myc. 146. 1869.

**1. Herpotrichia albidostoma** (Peck) Sacc. Syll. Fung. **9**: 857. 1891.

*Sphaeria albidostoma* Peck, Ann. Rep. N. Y. State Mus. **32**: 51. 1891.

On rotten wood and branches and coconut shells, Porto Rico:—Trinidad; continental North America.

Specimens reported under the name of *Herpotrichia diffusa* (Schw.) Ellis & Ev. belong here. The two species closely resemble each other in general appearance but differ in spore characters.

### 3. HYPOSPILA Fries, Summa Veg. Scand. 421. 1869.

**1. Hypospila cordiana** Ellis & Kelsey, Bull. Torrey Club **24**: 208. 1897.

On *Cordia glabra* L., St. Croix:—endemic.

4. **LASIOSPHAERIA** Ces. & De-Not. Comm. Critt. Ital. **1**: 229. 1863.

1. **Lasiosphaeria pezizula** (Berk. & Curt.) Sacc. Syll. Fung. **2**: 195. 1883.
*Sphaeria pezizula* Berk. & Curt. Grevillea **4**: 106. 1875.
On dead wood and bark, Porto Rico:—Bermuda; continental North America.

5. **LIZONIA** Ces. & De-Not. Comm. Critt. Ital. **1**: 229. 1863.

1. **Lizonia Jacquiniae** Bri. & Har. Rev. Myc. **13**: 16. 1891.
Reported on *Jacquinia Barbasco* (Loefl.) Mez., Porto Rico:—Jamaica.

6. **MELANOMMA** Nitschke; Fuckel, Symb. Myc. 159. 1869.

1. **Melanomma nitidulum** Bres. Bot. Jahr. **17**: 500. 1893.
Reported from the Sintenis collection, Porto Rico:—endemic.

7. **PHAEOSPORA** Zopf. Nova Acta Leop.-Carol. **70**: 280. 1898.

1. **Phaeospora cacticola** Stevens, Trans. Ill. Acad. Sci. **10**: 177. 1917.
On *Rhipsalis Cassutha* Gaertn., Porto Rico:—endemic.

8. **ROSELLINIA** De-Not. Atti Sci. Ital. **6**: 485. 1845.

1. **Rosellinia aquila** (Fries) De-Not. loc. cit.
*Sphaeria aquila* Fries, Syst. Myc. **2**: 442. 1822.
On dead wood, Porto Rico:—continental America; Europe; Asia.

2. **Rosellinia bunodes** (Berk. & Br.) Sacc. Syll. Fung. **1**: 254. 1882.
*Sphaeria bunodes* Berk. & Br. Jour. Linn. Soc. **14**: 125. 1875.
On dead wood of coffee and other hosts, Porto Rico:—Ceylon.

3. **Rosellinia metachroa** Ferd. & Winge, Bot. Tidssk. **29**: 16. 1908.
On bark, St. Croix; St. Jan:—endemic.

5. **Rosellinia mutans** (Cooke & Peck) Sacc. Syll. Fung. **1**: 259. 1882.
*Sphaeria mutans* Cooke & Peck; Peck, Ann. Rep. N. Y. State Mus. **26**: 87. 1874.
On dead wood, Porto Rico:—continental America; Europe; Asia.

6. **Rosellinia paraguayensis** Starb. Arkiv. Bot. $2^5$: 15. 1904.
On dead sugar stalks, Porto Rico:—South America.

7. **Rosellinia pulveracea** (Ehr.) Fuckel, Symb. Myc. 149. 1869.
*Sphaeria pulveracea* Ehr.; Pers. Syn. Fung. 83. 1801.
On dead sugar cane stalks, Porto Rico:—continental America; Europe.

8. **Rosellinia subiculata** (Schw.) Sacc. Syll. Fung. **1**: 255. 1882.
*Sphaeria subiculata* Schw. Schr. Nat. Ges. Leipzig **1**: 44. 1822.
On dead wood, Porto Rico; St. Croix; St. Jan:—continental North America.

9. **Rosellinia St. Cruciana** Ferd. & Winge, Bot. Tidssk. **29**: 16. 1908.
On petioles of *Cocos nucifera* L., St. Jan; St. Croix:—endemic.

9. **TRICHOSPHAERIA** Fuckel, Symb. Myc. 144. 1869.

1. **Trichosphaeria acanthostroma** (Mont.) Sacc. Syll. Fung. **1**: 454. 1882.
*Sphaeria acanthostroma* Mont. Syll. Crypt. 226. 1856.
On bark, Porto Rico:—continental America.

10. **ZIGNOELLA** Sacc. Michelia **1**: 346. 1878.

1. **Zignoella algaphila** Stevens, Bot. Gaz. **69**: 256. 1920.
On *Cephaleuros virescens* Kunze on *Artocarpus communis* Forst., Porto Rico:—endemic.

2. **Zignoella Magnolieae** Tracy & Earle, Bull. Torrey Club **23**: 211. 1896.
On dead bark, Porto Rico:—continental North America.

## Family 2. **AMPHISPHAERIACEAE.**

1. **AMPHISPHAERIA** Ces. & De-Not. Comm. Critt. Ital. **1**: 225. 1863.

1. **Amphisphaeria portoricensis** Petrak, Ann. Myc. **22**: 20. 1924.
On small twigs, Porto Rico:—endemic.

## Family 3. **GNOMONIACEAE.**

1. **GLOMERELLA** Schr. & Spald. Science II. **17**: 751. 1903.
*Gnomoniopsis* Stonem. Bot. Gaz. **26**: 114. 1898.

1. **Glomerella piperata** (Ellis & Ev.) Spald. & Schr. Science II. **17**: 751. 1903.
*Gloesporium piperatum* Ellis & Ev. Halsted, N. J. Agr. Exp. Sta. Rep. **2**: 358. 1890.
On *Capsicum annuum* L., *C. frutescens* L., Porto Rico:—continental North America.

2. **Glomerella rufomaculans** (Berk.) Spald. & Schr. Science II. **17**: 751. 1903.
*Septoria rufomaculans* Berk. Gard. Chronicle **1854**: 676.
*Gloesporium rufomaculans* Thüm. Fungi Pomicoli 59. 1879.
*Gloesporium Vanillae* Cooke, Grevillea **15**: 18. 1886.
*Gloesporium cingulatum* Atk. Cornell Univ. Agr. Exp. Sta. Bull. **49**: 314. 1892.
*Gloesporium Psidii* G. Del. Bull. Soc. Myc. Fr. **19**: 143. 1903.
On *Psidium Guajava* L., [*Vanilla Vanilla* (L.) Britton *Vanilla planifolia* Andr.]; also on dead twigs of *Citrus* sp., Porto Rico:—continental North America.

## Family 4. **CLYPEOSPHAERIACEAE.**

1. **ANTHOSTOMELLA** Sacc. Atti Soc. Veneto-Trent. **4**: 85. 1875.

1. **Anthostomella Cecropiae** (Rehm) Höhn. Sitz.-ber. Akad. Wien. **118**: 1510. 1909.
*Physalospora Cecropiae* Rehm, Hedwigia **40**: 112. 1901.
*Auerswaldia Cecropiae* P. Henn. Hedwigia **43**: 253. 1904.
On *Cecropia peltata* L., Porto Rico:—continental South America.
The genus *Trabutia* Sacc. & Roum. has been transferred to the Dothideales by Theissen and Sydow because its type species *T. quercina* has a distinctly dothideaceous stroma, no cell wall being present. So far as the writers are aware all the known species of the genus belong in the Dothideales. The new genus *Clypeotrabutia* is proposed here to take care of the 1-celled, hyaline-spored forms of the Clypeosphaeriaceae. A cross section of the type species of this genus, *Trabutia portoricensis* shows the presence of a true perithecial wall bordering the perithecia and shows also a distinct clypeus bordering the region of the ostiolum.

2. **Anthostomella Rhizomorphae** (Kunze) Berl. & Vogl. in Sacc. Syll. Fung. **9:** 508. 1891.

*Sphaeria Rhizomorphae* Kunze; Curr. Trans. Linn. Soc. **22:** 332. 1859.

On *Rhizophora Mangle* L., Porto Rico:—endemic.

2. **CLYPEOTRABUTIA** gen. nov.

Perithecia globose, provided with true perithecial walls, immersed in the tissues of the host, with the necks slightly protruding; clypeus evident, black, bordering the upper portion of the perithecium around the region of the ostiolum; asci cylindrical or cylindrical-clavate, 8-spored; spores 1-celled, hyaline; paraphyses present. Type species, *Trabutia portoricensis* Stevens.

1. **Clypeotrabutia portoricensis** (Stevens) comb. nov.

*Trabutia portoricensis* Stevens, Bot. Gaz. **70:** 401. 1920.

"Spots approximately circular, densely set with perithecia, area of young spot not at all or but slightly discolored, tissue of old spots dead, tan-colored. Perithecia conspicuous above, due to the shining, black clypeus, from below by the protuberance which they cause. Perithecial opening epiphyllous, clypeus black, 80–95 $\mu$ in diameter. Ostiole central, 10–15 $\mu$ in diameter. Perithecium central in the mesophyll. Asci irregular, thin-walled, 8-spored, inordinate, 68 $\times$ 17 $\mu$. Paraphyses many; spores filiform, oblong, obtuse, 24 $\times$ 7 $\mu$, continuous hyaline."

On *Coccolobis venosa* L. [*C. nivea* Jacq.], Herbarium University of Illinois, Porto Rican fungi (Stevens) No. *3907* a. Mayaguez, Oct. 31, 1913 (*type*), a portion of which is deposited in Chardon's herbarium as No. *1509;* id. id. (Stevens) No. *976*, Mayaguez, Apr. 30, 1913, a portion of which is deposited in Chardon's herbarium as No. *1486;* Cornell University Explorations of Porto Rico (Whetzel & Olive) No. *624*, Coamo, Apr. 24, 1916; id. id. (Chardon) Nos. *917* & *929*, Penuelas, July 19 & 24, 1920, respectively, Porto Rico:—endemic.

3. **LINOSPORA** Fuckel, Symb. Myc. 123. 1869.

1. **Linospora Trichostigmae** Stevens; Stevenson, Jour. Dept. Agr. Porto Rico **2:** 157. 1918, (hyponym); Bot. Gaz. **70:** 399. 1920.

On *Trichostigma octandrum* (L.) H. Walt., Porto Rico:—endemic.

Family 5. **MYCOSPHAERELLACEAE.**

1. **GUIGNARDIA** Viala & Ravaz, Bull. Soc. Myc. Fr. **8:** 63. 1892.

1. **Guignardia Cephalariae** var. **Alternantherae** (Sacc.) Stevenson, Jour. Dept. Agr. Porto Rico **2:** 155. 1918.

*Laestadia Cephalariae* var. *Alternantherae* Sacc. Bol. Soc. Brot. **11:** 68. 1893.

On *Achyranthes sessilis* (L.) Steud. [*Alternanthera sessilis* R. Br.], Porto Rico:—Europe.

2. **Guignardia Clusiae** Stevens, Trans. Ill. Acad. Sci. **10:** 183. 1917.

On *Clusia Gundlachii* Stahl, Porto Rico:—endemic.

3. **Guignardia Helicteres** Stevens, Trans. Ill. Acad. Sci. **10:** 183. 1917.

On *Helicteres jamaicensis* Jacq., Porto Rico:—endemic.

4. **Guignardia Heterotrichi** Stevens, Trans. Ill. Acad. Sci. **10:** 182. 1917.

On *Heterotrichum cymosum* (Wendl.) Urban, Porto Rico:—endemic.

5. **Guignardia Justiciae** Stevens; Stevenson, Jour. Dept. Agr. Porto Rico **2:** 155. 1918.

On *Stethoma verticillaris* (Nees) Britton [*Justicia verticillaris* (Nees) Urban], Porto Rico:—endemic.

6. **Guignardia Nectandrae** Stevens, Bot. Gaz. **69:** 255. 1920.

On *Nectandra coriacea* (Sw.) Griseb., Porto Rico:—endemic.

7. **Guignardia pipericola** Stevens, Trans. Ill. Acad. Sci. **10:** 183. 1917.

On *Piper marginatum* Jacq. and *Piper medium* Jacq., Porto Rico:—endemic.

8. **Guignardia prominens** Earle, Muhlenbergia **1:** 15. 1901.

On *Aegiphila martinicensis* Jacq., Porto Rico:—endemic.

9. **Guignardia Rhynchosporae** Stevens, Trans. Ill. Acad. Sci. **10:** 184. 1917.

On *Rynchospora cyperoides* (Sw.) Mart., Porto Rico:—endemic.

10. **Guignardia Tetrazygia** Stevens; Stevenson, Jour. Dept. Agr. Porto Rico **2:** 155. 1917.

On *Tetrazygia elaeagnoides* (Sw.) DC., Porto Rico:—endemic.

2. **MYCOSPHAERELLA** Johans. Ofr. Vet.-Akad. Förh. 1884: 163.

1. **Mycosphaerella aggregata** Earle, sp. nov.

Perithecia gregarious, often 2 or 3 or more confluent in a substromatic mass, membranaceous, small, 60–75 $\mu$ in diameter; ostiola perforate, large, 14 $\mu$ in diameter; asci oval to obovate, 40 $\times$ 15 $\mu$; spores distichous or inordinate, oblong, the ends obtuse, equally 1-septate, not constricted, hyaline, 12–14 $\times$ 3–4 $\mu$.

On indistinct spots on dead leaf tips of *Hymenocallis* near Santurce, Jan. 10, 1899, Heller *70* a, Porto Rico:—endemic.

2. **Mycosphaerella Anthurii** Miles, Trans. Ill. Acad. Sci. **10:** 252. 1917.

On *Anthurium acaule* (Jacq.) Schott, Porto Rico:—endemic.

3. **Mycosphaerella Chrysobalani** Miles, Trans. Ill. Acad. Sci. **10:** 252. 1917.

On *Chrysobalanus Icaco* L., Porto Rico:—endemic.

4. **Mycosphaerella citrullina** (Chester) Grossenb. Tech. Bull. N. Y. Agr. Exp. Station **9:** 226. 1909.

*Phyllosticta citrullina* Chester, Bull. Torrey Club **18:** 374. 1891.

On *Cucumis Melo* L., Porto Rico:—continental North America.

5. **Mycosphaerella Clusiae** Stevens, Trans. Ill. Acad. Sci. **10:** 181. 1917.

On *Clusia rosea* Jacq., Porto Rico:—endemic.

6. **Mycosphaerella Didymopanacis** Miles, Trans. Ill. Acad. Sci. **10:** 249. 1917.

On *Didymopanax Morototoni* (Aubl.) Dcne. & Pl., Porto Rico:—endemic.

7. **Mycosphaerella dubia** Miles, Trans. Ill. Acad. Sci. **10:** 250. 1917.

On *Solanum* sp., Porto Rico:—endemic.

8. **Mycosphaerella Fragariae** (Tul.) Lindau, E. & P. Nat. Pfl. $1^1$: 424. 1897.

*Sphaeria Fragariae* Tul. Ann. Sci. Nat. IV. **5**: 112. 1856.

On *Fragaria* sp., Porto Rico:—continental North America.

9. **Mycosphaerella Guttiferae** Miles, Trans. Ill. Acad. Sci. **10**: 250. 1917.

On *Clusia Gundlachii* Stahl, Porto Rico:—endemic.

10. **Mycosphaerella maculiformis** (Pers.) Schröt. Krypt.-Fl. Schles. $3^2$: 333. 1908.

*Sphaeria maculiformis* Pers. Syn. Fung. 90. 1801.

On *Inga Inga* (L.) Britton, Porto Rico:—continental North America.

11. **Mycosphaerella maxima** Miles, Trans. Ill. Acad. Sci. **10**: 251. 1917.

On unknown host, Porto Rico:—endemic.

12. **Mycosphaerella Maydis** (Passer.) Lindau in E. & P. Nat. Pfl. $1^1$: 424. 1897.

*Sphaerella Maydis* Passer.; Rab. Fungi Eu. *1851*. 1874.

On *Syntherisma sanguinalis* (L.) Dulac., Porto Rico:—Europe.

13. **Mycosphaerella Mucunae** Stevens, Trans. Ill. Acad. Sci. **10**: 182. 1917.

On *Stizolobium pruritum* (Wight) Piper, Porto Rico:—endemic.

14. **Mycosphaerella Palmae** Miles, Trans. Ill. Acad. Sci. **10**: 252. 1917.

On leaves of palms, Porto Rico:—endemic.

15. **Mycosphaerella Perseae** Miles, Trans. Ill. Acad. Sci. **10**: 251. 1917.

On *Persea Persea* (L.) Cockerell, Porto Rico:—endemic.

16. **Mycosphaerella Sacchari** (Speg.) comb. nov.

*Sphaerella Sacchari* Speg. Rev. Agr. Univ. La Plata **1896**: 30.

On dead leaves of *Saccharum officinarum* L., Porto Rico:—South America.

17. **Mycosphaerella subastoma** Stevens & Dalbey, Mycologia **11**: 8. 1919.

On *Anemia adiantifolia* (L.) Sw., Porto Rico:—endemic.

18. **Mycosphaerella Tabebuiae** Miles, Trans. Ill. Acad. Sci. **10**: 249. 1917.

On *Tabebuia haemantha* (Bert.) DC., Porto Rico:—endemic.

19. **Mycosphaerella tetraspora** Seaver, sp. nov.

Spots numerous, subcircular in outline, light colored in the center with a dark brown border, reaching a diameter of 1 mm.; perithecia few to each spot and usually located near the center of the infected area; asci clavate 40–45 × 8 μ, 4-spored (so far as observed); spores fusoid, 1-septate, hyaline 12–14 × 3–4 μ.

On living leaves of *Commelina elegans* H. B. K.

Type collected at Mayaguez, February, 1923. No. *413*. All spots do not show perithecia and it is not easy to get asci and spores. After some persistence, however, several mounts were made. Only four spores could be detected in the asci examined. Some ascomycetes which normally produce eight will sometimes show only four mature ones. So some allowance should be made in case the number should be found to vary.

20. **Mycosphaerella tirolensis** (Auersw.) Magn. Pilze Tirol 463. 1905.
*Sphaerella tirolensis* Auersw. Syn. Pyrenom. Eu. 20. 1869.
On *Pityrogramma sulphurea* (Sw.) Maxon [*Gymnogramma sulphurea* (Sw.) Desv.], Porto Rico:—Europe.

3. **PHAEOSPHAERELLA** Karst. Medd. Soc. Fauna Fl. Fenn. **16:** 28. 1888.

1. **Phaeosphaerella Paspali** Tehon, Bot. Gaz. **67:** 508. 1919.
On *Paspalum glabrum* Poir., Porto Rico:—endemic.

4. **STIGMATEA** Fries, Summa Veg. Scand. 421. 1849.

1. **Stigmatea Piperis** Rehm, Hedwigia **40:** 105. 1901.
On leaves of *Piper Amalago* L., St. Jan:—South America.

2. **Stigmatea Guettardae** Tehon, Bot. Gaz. **67:** 508. 1919.
On *Guettarda ovalifolia* Urban, Porto Rico:—endemic.

## Family 6. **PLEOSPORACEAE.**

1. **LEPTOSPHAERIA** Ces. & De-Not. Comm. Critt. Ital. **1:** 234. 1863.

1. **Leptosphaeria Sacchari** van Breda de Haan, Meded. Proefst. Suik. West-Java **1892:** 25.
On *Saccharum officinarum* L., Porto Rico:—Java.
*Leptosphaeria saccharicola* P. Henn. has also been doubtfully reported on the same host.

2. **METASPHAERIA** Sacc. Syll. Fung. **2:** 156. 1883.

1. **Metasphaeria abortiva** Stevens, Trans. Ill. Acad. Sci. **10:** 186. 1917.
On *Calyptracordia alba* (Jacq.) Britton [*Varronia alba* Jacq.], Porto Rico:—endemic.

3. **OPHIOBOLUS** Riess, Hedwigia **1:** 27. 1854.

1. **Ophiobolus barbatus** Pat. & Gaill. Bull. Soc. Myc. Fr. **4:** 114. 1888.
On *Vitex* sp., Porto Rico:—continental South America.

4. **PHYSALOSPORA** Niessl, Verh. Nat. Ver. Brünn **14:** 10. 1876.

1. **Physalospora Andirae** Stevens, Trans. Ill. Acad. Sci. **10:** 184. 1917.
On *Andira inermis* H. B. K., Porto Rico:—endemic.

2. **Physalospora Bambusae** (Rab.) Sacc. Syll. Fung. **1:** 446. 1882.
*Sphaeria Bambusae* Rab. Hedwigia **17:** 45. 1878.
On *Lasiacis sorghoidea* (Desv.) H. & C., Porto Rico:—India.

3. **Physalospora carophyllinicola** Stevens, Trans. Ill. Acad. Sci. **10:** 184. 1917.
On *Drymaria cordata* (L.) Willd., Porto Rico:—endemic.

4. **Physalospora Ecastophylli** (Lév.) Sacc. Syll. Fung. **1:** 446. 1882.
*Sphaeria Ecastophylli* Lév. Ann. Sci. Nat. III. **3:** 54. 1845.
On *Ecastophyllum Ecastophyllum* (L.) Britton [*Pterocarpus Ecastophyllum* L.], Porto Rico:—endemic.

5. **Physalospora Hoyae** Höhn. Sitz.-ber. Akad. Wien. **114:** 122. 1907.
On *Ficus* sp., Mona Island:—Samoa Islands.

6. **Physalospora Laguncularíae** Rehm, Hedwigia **40:** 113. 1901.
On *Laguncularia racemosa* (L.) Gaertn., Porto Rico:—South America.

7. **Physalospora tucumanensis** Speg. Rev. Agr. Univ. La Plata **1896:** 228.
On dead sugar cane stalks, *Saccharum officinarum* L., Porto Rico:—South America.

## Family 7. CUCURBITARIACEAE.

### 1. OTTHIA Nitschke; Fuckel, Symb. Myc. Nachtr. **1:** 19. 1871.

1. **Otthia Panici** Stevens, Trans. Ill. Acad. Sci. **10:** 185. 1917.
On *Panicum maximum* Jacq., Porto Rico:—endemic.

### 2. ROSTRONITSCHKIA Fitzp. Mycologia **11:** 165. 1919.

1. **Rostronitschkia nervincola** Fitzp. Mycologia **11:** 166. 1919.
*Nitschkia nervicola* Rehm (in litt.).
On *Pentarhaphia albiflora* Dcne., Porto Rico:—Jamaica.

### 3. THAXTERIA Sacc. Syll. Fung. **9:** 687. 1891.

1. **Thaxteria leptosporioides** (Winter) Fitzp. Mycologia **15:** 60. 1923.
*Coloesphaeria leptosporioides* Winter, Hedwigia **22:** 2. 1883.
*Nitschkia rugulosa* (Rick) Höhn. Sitz.-ber. Akad. Wien **123:** 58, 59. 1914.
*Leptosporella leptosporioides* Höhn. Ann. Myc. **16:** 105. 1918.
This fungus has been reported by Stevenson as *Bertia moriformis* (Tode) De-Not.
On dead wood, Porto Rico:—continental America, Europe.

## Family 8. VALSACEAE.

### 1. VALSA Fries, Summa Veg. Scand. 410. 1849.

1. **Valsa chlorina** Pat. Bull. Soc. Myc. Fr. **22:** 56. 1906.
*Eutypella Cocos* Ferd. & Winge, Vidensk. Meddel. **1908:** 141.
*Scoptria chlorina* Petrak, Ann. Myc. **22:** 79. 1924.
On husks of *Cocos nucifera* L., Porto Rico; St. Croix:—French Polynesia.

2. **Valsa Sacchari** Stevenson, Jour. Dept. Agr. Porto Rico **2:** 157. 1918.
On dead sugar cane stalks, *Saccharum officinarum* L., Porto Rico:—endemic.

### 2. EUTYPA Tul. Fung. Carp. **2:** 52. 1863.

1. **Eutypa aurantiicola** Speg. Anal. Soc. Ci. Argent. **26:** 26. 1888.
On stumps of wood, St. Jan; St. Thomas:—Europe.

2. **Eutypa flavovirescens** var. **multiceps** (Sow.) Sacc. Syll. Fung. **1:** 173. 1882.
*Sphaeria multiceps* Sow. Engl. Fungi. *pl. 394.* 1803.
On stumps of wood, St. Jan:—Europe.

Family 9. **MELANCONIDACEAE.**

1. **MELANCONIS** Tul. Fung. Carp. **2:** 115. 1863.

1. **Melanconis Sacchari** Massee; Speg. Rev. Agr. Univ. La Plata **1895:** 242.

According to Stevenson, a mistake for *Melanconium Sacchari* Mass. See Melanconiaceae.

2. **VALSARIA** Ces. & De-Not. Comm. Critt. Ital. **1:** 205. 1863.

1. **Valsaria subtropica** Speg. Anal. Mus. Nac. Buenos Aires III. **12:** 372. 1909.

On dead sugar cane stalks, *Saccharum officinarum* L., Porto Rico:—South America.

Family 10. **DIATRYPACEAE.**

1. **DIATRYPE** Fries, Summa Veg. Scand. 384. 1849.

1. ?**Diatrype Stigma** (Hoffm.) Fries, Summa Veg. Scand. 385. 1849.

On dead wood, Porto Rico:—Bahamas; continental America; Europe; Siberia.

The specimen is rather poor so that the determination is somewhat doubtful.

Family 11. **MELOGRAMMATACEAE.**

1. **BOTRYOSPHAERIA** Ces. & De-Not. Comm. Critt. Ital. **1:** 211. 1863.

1. **Botryosphaeria xanthocephala** (Syd. & Butler) Theiss. & Syd. Ann. Myc. **14:** 26. 1916.

*Physalospora xanthocephala* Syd. & Butler, Ann. Myc. **9:** 408. 1911.

On *Cajan Cajan* (L.) Millsp., Porto Rico:—India.

2. **ENDOTHIA** Fries, Summa Veg. Scand. 385. 1849.

1. **Endothia longirostris** Earle, Muhlenbergia **1:** 14. 1901.

On dead bark, Porto Rico:—Trinidad.

3. **MYRMAECIUM** Nitschke; Fuckel, Symb. Myc. 227. 1849.

1. ?**Myrmaecium Cannae** Dearn. & Barth.; Dearn. Mycologia **9:** 347. 1917.

On *Canna indica* L., Porto Rico:—endemic.

2. **Myrmaecium rubricosum** (Tul.) Fuckel, Symb. Myc. 227. 1869.

*Melogramma rubricosum* Tul. Fung. Carp. **2:** 84. 1863.

On dead bark, Porto Rico:—Europe.

Family 12. **XYLARIACEAE.**

1. **DALDINIA** Ces. & De-Not. Comm. Critt. Ital. **1:** 197. 1863.

1. **Daldinia concentrica** (Bolt.) Ces. & De-Not. Comm. Critt. Ital. **1:** 198. 1863.

*Sphaeria concentrica* Bolt. Fungi Halifax **3:** 180. 1789.

On dead wood, Porto Rico:—Cuba; Bahamas; continental America; Europe; Asia; Borneo; Ceylon; Tasmania; New Zealand; Java.

Also reported from St. Croix, St. Jan. and St. Thomas under the name of *Daldinia Eschscholzii.*

2. **HYPOXYLON** Bull. Champ. Fr. **1**: 168. 1809.

1. **Hypoxylon annulatum** (Schw.) Mont. in Hist. Chil. **7**: 445. 1854.

*Sphaeria annulata* Schw. Jour. Acad. Sci. Phila. **5**: 11. 1825.

On dead wood, Porto Rico:—Bahamas; continental North America; New Zealand.

2. **Hypoxylon citrinum** Shear, sp. nov.

Stromata subpulvinate, very irregular in shape, erumpent, gregarious or scattered, occasionally confluent, with somewhat irregular surface but thin and fragile, gray at first on the outside becoming dark chestnut to black with age and bright lemon yellow to golden within; 1–3 mm. across, frequently only 2 or 3 perithecia in a stroma and occasionally with separate perithecia; perithecia depressed-globose, mostly embedded in the scanty stroma, about ½ mm. in diameter, with a thin, fragile wall; ostioles papillate, small, black; asci cylindrical, stipitate, 75–85 $\mu$ long; paraphyses not seen; ascospores overlapping-uniseriate, short elliptic to subglobose, continuous, smooth, dark brown, 10.5–12 × 7–8 $\mu$.

Type, No. *378* Seaver & Chardon on dead corticate branches, Porto Rico, 1923, in Pathological Collections, U. S. Department of Agriculture and New York Botanical Garden.

The most striking character of this species is the bright light golden color of the inside of the stroma, which is usually noticeable in the specimens on account of their fragile character. The plant might have been referred to *Rosellinia* on account of the perithecia being occasionally separate, gregarious or only slightly united in stromata, but no description of it could be found under that genus.

3. **Hypoxylon fusco-purpureum** (Schw.) Berk. Jour. Linn. Soc. **10**: 385. 1868.

*Sphaeria fusco-purpurea* Schw. Jour. Acad. Sci. Phila. **5**: 16. 1825.

On dead citrous branches, Porto Rico:—Cuba; Bahamas; continental North America.

4. **Hypoxylon leucodermium** Shear, sp. nov.

Stromata subpulvinate, discoid or irregular in outline, superficial, appressed to the surface of the bark and attached at the center by a narrow base, gregarious or somewhat scattered, occasionally confluent, surface smooth or slightly roughened by the ostioles, carbonous without but soft within when fresh, whitened without when young with a thin, compact conidial layer which gradually disappears with age, apparently finally becoming black, white within, ¼–1 cm. in diameter, 2–3 mm. thick; perithecia black, globose to subglobose, entirely embedded in the stroma, ¾–1 mm. diameter; ostioles black, very slightly elevated, small; asci cylindrical, stipitate, p. sp. 180–200 × 13–15 $\mu$; paraphyses doubtful. The asci appear to be embedded in a hyaline gelatinous layer lining the inner surface of the perithecia. Spores uniseriate or slightly overlapping, elliptical, inequilateral, smooth, continuous, dark brown, 23–30 × 10–11.5 $\mu$.

Type, No. *632* Seaver & Chardon on decaying corticate branches, Porto Rico, 1923. In Pathological Collections, U. S. Department of Agriculture, and New York Botanical Garden.

The nearest relative of this species with which we are acquainted is *Hypoxylon Berterii* Mont., which we also have from Porto Rico and which is readily distinguished by the size of its ascospores, which are only 10–12 × 5–7.5 $\mu$, according to the type specimen which we have examined. Both species are somewhat intermediate in character between *Hypoxylon* and *Xylaria* in having the substance of the stroma of the structure and color of *Xylaria* and being attached at the center of the base.

5. **Hypoxylon perforatum** (Schw.) Fries, Summa Veg. Scand. 384. 1849.

*Sphaeria perforata* Schw. Schr. Nat. Ges. Leipzig **1**: 5. 1822.

On dead bamboo, Porto Rico:—continental North America; India; Ceylon.

6. **Hypoxylon pseudopachyloma** Speg. Bol. Acad. Ci. Cordoba **11:** 205. 1888.
On dead branches, St. Croix; St. Jan; St. Thomas:—South America.

7. **Hypoxylon rubiginosum** (Pers.) Fries, Summa Veg. Scand. 384. 1849.
*Sphaeria rubiginosa* Pers. Syn. Fung. 11. 1801.
On dead wood, Porto Rico; St. Croix; St. Jan; St. Thomas:—Cuba; continental North America; Europe; Ceylon; Java; North Africa.

8. **Hypoxylon St. Janianum** Ferd. & Winge, Bot. Tidssk. **29:** 14. 1908.
On branches ?, St. Jan:—endemic.

### 3. **KRETZSCHMARIA** Fries, Summa Veg. Scand. 409. 1849.

1. **Kretzschmaria coenopus** (Fries) Sacc. Syll. Fung. **9:** 565. 1891.
*Sphaeria coenopus* Fries, Linnaea **5:** 542. 1830.
On dead wood, Porto Rico:—Cuba; Central and South America.

2. **Kretzschmaria rugosa** Earle, Bull. N. Y. Bot. Garden **3:** 311. 1905.
On dead wood, Porto Rico:—St. Kitts; Trinidad.
While described as a *Kretzschmaria* this species probably belongs rather with the genus *Xylaria* and may be identical with *Xylaria tuberiformis* Berk. as has been suggested.

3. **Kretzschmaria Tuckerii** Lloyd, Myc. Notes **7:** 1353. 1925 (hyponym).
On rotten wood, Porto Rico:—endemic.

### 4. **NUMMULARIA** Tul. Fung. Carp. **2:** 42. 1863.

1. **Nummularia Bulliardii** Tul. Fung. Carp. **2:** 43. 1863.
Occurring on dead wood or occasionally a wound parasite on *Ficus nitida* Thunb. and other trees, Porto Rico; St. Jan; St. Thomas:—Bahamas; North America; Europe.

2. **Nummularia cincta** Ferd. & Winge, Bot. Tidssk. **29:** 15. 1909.
On dead wood, Porto Rico; St. Jan:—Hispaniola.

3. **Nummularia dura** Ferd. & Winge, Bot. Tidssk. **29:** 15. 1908.
On bark, St. Croix; St. Jan:—endemic.

4. **Nummularia emergens** Lloyd, Myc. Notes **7:** 1353.
Erumpent through the bark of unnamed host, Porto Rico:—endemic.

5. **Nummularia Glycyrrhiza** (Berk. & Curt.) Sacc. Syll. Fung. **1:** 401. 1882.
*Hypoxylon Glycyrrhiza* Berk. & Curt. Jour. Acad. Nat. Sci. Phila. II. **2:** 285. 1853.
Reported from the Sintenis collection, Porto Rico:—Central and South America.

6. **Nummularia punctulata** (Berk. & Rav.) Sacc. Syll. Fung. **1:** 399. 1882.
*Diatrype punctulata* Berk. & Rav. Grevillea **4:** 94. 1876.
On dead wood, Porto Rico:—continental North America.

7. **Nummularia repanda** Nitschke, Pyrenom. Germ. 57. 1867.

*Sphaeria repanda* Fries, Obs. Myc. **1**: 168. 1815.

On dead wood, Porto Rico:—North and Central America; Europe.

5. **PORONIA** Gledits.; Willd. Fl. Berol. 400. 1787.

1. **Poronia Chardoniana** Toro, sp. nov.

Stipitate, mummy-brown, small; stipe 0.5–1.5 mm. long, expanding above into a spherical stroma 0.25–1 mm. in diameter, mammilose from the slightly prominent perithecia; perithecia 1–4 in a stroma, ovate when solitary, otherwise globose, with a faintly developed beak, 115–140 $\mu$ in diameter; ostiola prominent, black, convex 12–18 $\mu$ in diameter; asci 8-spored, cylindrical, 132–140 $\times$ 15–19 $\mu$; ascus wall soon evanescent; spores mostly uniseriate, sometimes biseriate in the center of ascus, greenish and 0–several guttulate when young, dark continuous with age, brown, elliptical 33–42 $\times$ 15–18 $\mu$; paraphyses abundant but imperfectly developed.

On horse dung. Exp. of P. R. (W. K. & T. *2666*). Vieques, July 18, 1924. Cornell Herb. *14745* (Type).

2. **Poronia Oedipus** Mont. Syll. Fung. 209. 1856.

On manure, Porto Rico:—Bermuda; Cuba; continental America.

6. **SOLENOPLEA** Starb. Bih. Sv. Vet.-Akad. Handl. **27** (3)[9]: 13. 1901.

1. **Solenoplea peltata** Lloyd, Myc. Notes **7**: 1354. 1925.

On wood, Porto Rico:—endemic.

7. **SPIROGRAMMA** Ferd. & Winge, Vidensk. Meddel. **1908**: 142. 1908.

1. **Spirogramma Boergesenii** Ferd. & Winge, Vidensk. Meddel. **1908**: 143.

On dead branches, St. Croix; St. Jan:—endemic.

8. **USTULINA** Tul. Fung. Carp. **2**: 23. 1863.

1. **Ustulina vulgaris** Tul. Fung. Carp. **2**: 23. 1863.

On dead wood and on the larger roots and crowns of dying grape fruit trees, Porto Rico:—Cuba; continental America; Europe; Ceylon.

Probably the same fungus as reported from the Schwanecke collection as *Hypoxylon vulgare* Link.

9. **XYLARIA** Hill. Hist. Pl. 62. 1773.

1. **Xylaria æmulans** Starb. Bih. Sv. Vet.-Akad. Handl. **27** (3)[9]: 13. 1901.

On wood, Porto Rico:—continental South America.

2. **Xylaria apiculata** Cooke, Grevillea **8**: 66. 1879.

On dead wood, Porto Rico:—New Zealand.

3. **Xylaria appendiculata** Ferd. & Winge, Bot. Tidssk. **29**: 17. 1908.

On dried leaves of *Enallagma latifolia* (Mill.) Small [*Crescentia cucurbitina* L.], St. Croix:—endemic.

4. **Xylaria Arbuscula** Sacc. Michelia **1**: 249. 1878.

On dead wood, Porto Rico:—Bermuda; Bahamas; continental North America; Europe.

Some are inclined to regard this as a branched form of the preceding.

5. **Xylaria aristata** Mont. Ann. Sci. Nat. IV. **3**: 107. 1855.

On dead leaves, Porto Rico:—Bahamas; continental South America; Borneo.

6. **Xylaria axifera** Mont. Ann. Sci. Nat. IV. **3**: 106. 1855.

On dead wood, Porto Rico:—Cuba; Borneo; Java.

7. **Xylaria Berkeleyi** Mont. Ann. Sci. Nat. IV. **3**: 104. 1855.

On dead wood, Porto Rico:—continental South America.

8. **Xylaria clavicularis** Klotzsch, Linnaea **25**: 365. 1852.

On rotten wood, Porto Rico:—endemic.
Reported from the Schwanecke collection.

9. **Xylaria consociata** Starb. Bih. Sv. Vet.-Akad. Handl. **27** (3)[9]: 17. 1901.

On old wood, Porto Rico:—continental South America.

10. **Xylaria cubensis** Mont. Syll. Crypt. 202. 1856.

On dead wood, Porto Rico:—Cuba; continental South America.
*Xylaria involuta* of the Sintenis collection is regarded by recent workers as identical with this species.

11. **Xylaria euglossa** Fries, Nova Acta. Soc. Sci. Ups. III. **1**: 124. 1855.

On wood, Porto Rico:—Costa Rica.
The present species is recorded on determination made by C. G. Lloyd.

12. **Xylaria Gomphus** Fries, Nov. Symb. Myc. 127. 1855.

Reported from the Sintenis collection, Porto Rico:—continental South America.

13. **Xylaria fimbriata** Lloyd, Myc, Notes **51**: 726. 1917.

On dead wood and soil, Porto Rico:—endemic.

14. ?**Xylaria Hypoxylon** (L.) Grev. Fl. Edin. 355. 1824.

*Clavaria Hypoxylon* L. Sp. Pl. 1182. 1753.

On dead wood, Porto Rico:—Cuba; continental America; Europe; Asia; Australia; Java.
The report is based on a sterile specimen so that the identity is somewhat doubtful.

15. **Xylaria inaequalis** Berk. & Curt. Jour. Linn. Soc. **10**: 382. 1868.

On wood, Porto Rico:—Cuba.

16. **Xylaria lignosa** Ferd. & Winge, Bot. Tidssk. **29**: 18. 1908.

On trunks, St. Croix:—endemic.

17. **Xylaria multiplex** (Kunze) Berk. & Curt. Jour. Linn. Soc. **10**: 381. 1868.

*Sphaeria multiplex* Kunze, Linnaea **5**: 536. 1830.

On old pods of *Hymenaea Courbaril* L., Porto Rico:—Cuba; continental South America; New Zealand; Java.

18. **Xylaria myosurus** Mont. Syll. Crypt. 206. 1856.

On wood, Porto Rico:—continental South America.

19. **Xylaria obovata** (Berk.) Berk. Jour. Linn. Soc. **10:** 380. 1868.

*Sphaeria obovata* Berk. Ann. Nat. Hist. **3**: 397. 1839.

On wood, Porto Rico:—Cuba; St. Vincent; continental South America.
This species has been recorded from Porto Rico but the specimen on which the report is based agrees with *Kretzschmaria rugosa* Earle which as indicated before may be a *Xylaria*.

20. **Xylaria obtusissima** (Berk.) Sacc. Syll. Fung. **1:** 318. 1882.

*Hypoxylon obtusissimum* Berk. Ann. Mag. Nat. Hist. II. **9**: 202. 1852.

On wood, Porto Rico:—Santo Domingo.
Reported from the Sintenis collection.

21. **Xylaria partita** Lloyd, Myc. Notes **48:** 675. 1917.

On dead wood, Porto Rico:—endemic.

22. **Xylaria polymorpha** (Pers.) Grev. Fl. Edin. 355. 1824.

*Sphaeria polymorpha* Pers. Syn. Fung. 7. 1801.

On wood, Porto Rico:—continental North and Central America; Europe; Asia; Australia; Java.
Reported from both the Sintenis and Schwanecke collections.

23. **Xylaria portoricensis** Klotzsch, Linnaea **25:** 364. 1852.

On wood, Porto Rico:—endemic.
Reported from both the Sintenis and Schwanecke collections.

24. **Xylaria Schweinitzii** Berk. & Curt. Jour. Acad. Nat. Sci. Phil. II. **2:** 284. 1853.

On dead wood, Porto Rico:—continental North America.

25. **Xylaria scopaeformis** Mont.; Berk. & Br. Jour. Linn. Soc. **14:** 119. 1873.

On dead wood, Porto Rico:—Cuba; continental South America; Ceylon.

26. **Xylaria sessilis** Ferd. & Winge, Bot. Tidssk. **29:** 18. 1908.

On bark, St. Thomas:—endemic.

27. **Xylaria subtorulosa** Speg. Bol. Acad. Ci. Cordoba **11:** 515. 1889.

On mossy trunks, St. Thomas:—South America.

28. **Xylaria subtrachelina** P. Henn. Hedwigia **43:** 207. 1904.

On brittle wood, St. Croix:—South America.

29. **Xylaria tabacina** (Kickx) Berk. Jour. Bot. & Kew Mis. **6:** 225. 1854.

*Hypoxylon tabacinum* Kickx, Bull. Acad. Brux. $8^2$: 76. 1841.

On wood. Reported from Porto Rico under the name of *Xylaria involuta* Cooke, which is regarded as a synonym of the above. See Grevillea **13**: 9. 1884.
Porto Rico:—Cuba; South America; Asia.

Order 12. **PEZIZALES.**

Asci operculate.
- Spores remaining permanently hyaline or pale brownish, never purple. — Fam. 1. PEZIZACEAE.
- Spores becoming purple, fading to brown. — Fam. 2. ASCOBOLACEAE.

Asci inoperculate.
- Apothecia superficial.
  - Apothecia club-shaped. — Fam. 3. GEOGLOSSACEAE.
  - Apothecia discoid or cup-shaped.
    - Fleshy or waxy, the ends of the paraphyses free.
      - Color bright, usually yellow. — Fam. 4. HELOTIACEAE.
      - Color dull or dark. — Fam. 5. MOLLISIACEAE.
    - Leathery or cartilaginous, the ends of the paraphyses forming an epithecium. — Fam. 6. PATELLARIACEAE.
- Apothecia erumpent. — Fam. 7. CENANGIACEAE.

Family 1. **PEZIZACEAE.**

1. **COOKEINA** Kuntze, Rev. Gen. Pl. **2:** 849. 1891.

1. **Cookeina sulcipes** (Berk.) Kuntze, Rev. Gen. Pl. **2:** 849. 1891.

*Peziza sulcipes* Berk. Jour. Bot. **1:** 141. 1842.

On dead and rotten wood, Porto Rico:—Cuba; Jamaica; Santo Domingo; Trinidad; Mexico; Central and South America; Samoa; Java.

2. **Cookeina tetraspora** Seaver, Mycologia **17:** 45. 1925.

On decaying leaves of some palm, also on old stick, Porto Rico:—endemic.

3. **Cookeina Tricholoma** (Mont.) Kuntze, Rev. Gen. Pl. **2:** 849. 1891.

*Peziza Tricholoma* Mont. Ann. Sci. Nat. II. **2:** 77. 1834.

On dead wood, Porto Rico:—Cuba; Santo Domingo; Jamaica; Guadeloupe; Trinidad; Mexico; southeastern United States; Central and South America; Philippine Islands; West Africa.

2. **HUMARIA** (Fries) Sacc. Syll. Fung. **8:** 118. 1889.

1. **Humaria Cookeina** Seaver, Mycologia **17:** 46. 1925.

On dead sticks, Porto Rico:—endemic.

2. **Humaria phyllogena** Seaver, Mycologia **17:** 46. 1925.

On dead leaves, Porto Rico:—endemic.

3. **LACHNEA** Gill. Champ. Fr. Discom. 57. 1879.

1. **Lachnea coprinaria** (Cooke) Phill. Brit. Discom. 224. 1887.

*Peziza coprinaria* Cooke, Grevillea **4:** 91. 1875.

On dung, Porto Rico:—continental America; Europe.

2. **Lachnea cubensis** (Berk. & Curt.) Sacc. Syll. Fung. **8:** 176. 1889.

*Peziza cubensis* Berk. & Curt. Jour. Linn. Soc. **10:** 366. 1868.

On dead sugar cane and debris, Porto Rico:—Cuba; Jamaica; Bahamas; Trinidad; Texas; continental South America.

3. **Lachnea scutellata** (L.) Gill. Champ. Fr. Discom. 75. 1882.
*Peziza scutellata* L. Sp. Pl. 1181. 1753.

Reported on *Musa* sp. from St. Croix:—continental North America; Mexico; Europe. The present species is very similar to the preceding and specimens reported under this name may be identical with that one.

4. **LAMPROSPORA** De-Not. Comm. Critt. Ital. **1**: 388. 1863.

1. **Lamprospora discoidea** (P. Henn. & Nym.) Seaver, Mycologia **6**: 19. 1914.
*Barlaea discoidea* P. Henn. & Nym. Monsunia **1**: 33. 1900.

On the ground, Porto Rico:—continental North America.

2. **Lamprospora salmonicolor** Seaver, Mycologia **17**: 47. 1925.

On bare soil, Porto Rico:—endemic.

3. **? Lamprospora Wrightii** (Berk. & Curt.) Seaver, Mycologia **6**: 15. 1914.
*Peziza Wrightii* Berk. & Curt.; Berk. & Br. Ann. Mag. Nat. Hist. III. **15**: 444. 1865.

On soil, Porto Rico:—Cuba; continental North America; Europe.

5. **PEZIZA** (Dill.) L. Sp. Pl. 1180. 1753.

1. **Peziza adnata** Berk. & Curt. Jour. Linn. Soc. **10**: 365. 1868.

On wood, Porto Rico:—Cuba.

6. **PHILLIPSIA** Berk. Jour. Linn. Soc. **18**: 388. 1881.

1. **Phillipsia domingensis** Berk. Jour. Linn. Soc. **18**: 388. 1881.
*Peziza domingensis* Berk. Ann. Mag. Nat. Hist. II. **9**: 201. 1852.

On dead wood, Porto Rico:—Cuba; Santo Domingo; Jamaica; continental South America; Australia; Japan; Africa; Samoa.

2. **Phillipsia Chardoniana** Seaver, Mycologia **17**: 48. 1925.

On decaying wood, Porto Rico:—endemic.
This species is known from a single collection by Chardon near Adjuntas. The large size and brilliant color make it a conspicuous plant and it should be recollected.

7. **PYRONEMA** Carus, Nov. Act. Acad. Nat. Cur. **17**: 370. 1835.

1. **Pyronema omphalodes** (Bull.) Fuckel, Symb. Myc. 319. 1869.
*Peziza omphalodes* Bull. Herb. Fr. *pl. 485, f. 1.* 1790. Hist. Champ. 264. 1809.

On burnt ground, Porto Rico; St. Croix:—probably world wide.
Although apparently occurring on burnt ground everywhere, this fungus is seldom collected except by those who are familiar with its appearance and habits. The first collection recorded from Porto Rico was obtained by us in 1923.

Family 2. **ASCOBOLACEAE.**

1. **ASCOBOLUS** Pers. in L. Syst. Nat. 1461. 1791.

1. **Ascobolus immersus** Pers. Obs. Myc. **1**: 35. 1796.

Grown by the writer on dung collected in Porto Rico by B. Fink:—Bermuda; continental North America; Europe.

2. **Ascobolus magnificus** Dodge, Mycologia **4**: 218. 1912.

On cow manure, Porto Rico:—continental North America.

3. **Ascobolus stercorarius** (Bull.) Schröt. Krypt.-Fl. Schles. $3^2$: 56. 1908.

*Peziza stercoraria* Bull. Herb. Fr. *pl. 376, f. 1.* 1787.

On cow dung, Porto Rico:—Bermuda; continental America; Europe; Africa.

2. **ASCODESMIS** Van Tiegh. Bull. Soc. Bot. Fr. **23**: 271. 1876.

1. **Ascodesmis porcina** Seaver, Mycologia **8**: 3. 1916.

On pig dung, Porto Rico:—continental North America.

This inconspicuous species has been obtained once on pig dung from Porto Rico and once on similar substratum from New Jersey.

3. **ASCOPHANUS** Boud. Ann. Sci. Nat. V. **10**: 241. 1869.

1. **Ascophanus carneus** (Pers.) Boud. Ann. Sci. Nat. V. **10**: 250. 1869.

*Ascobolus carneus* Pers. Syn. Fung. 676. 1801.

On dung, Porto Rico; St. Thomas:—Bermuda; continental North America. Europe.

2. **Ascophanus granulatus** (Bull.) Speg. Michelia **1**: 235. 1878.

*Peziza granulata* Bull. Herb. Fr. *pl. 438, f. 3.* 1789.

On dung and debris, Porto Rico:—continental America; Europe; Ceylon.

3. **Ascophanus testaceus** (Moug.) Phill. Brit. Discom. 310. 1887.

*Peziza testacea* Moug.; Fries, Elench. Fung. **2**: 11. 1828.

On rotten leather, Porto Rico:—continental North America: Europe.

4. **SACCOBOLUS** Boud. Ann. Sci. Nat. V. **10**: 228. 1869.

1. **Saccobolus Kerverni** (Crouan) Boud. Ann. Sci. Nat. V. **10**: 229. 1869.

*Ascobolus Kerverni* Crouan, Ann. Sci. Nat. IV. **10**: 193. 1858.

On dung, Porto Rico:—Bermuda; continental America; Europe.

2. **Saccobolus portoricensis** Seaver; Stevenson, Jour. Dept. Agr. Porto Rico **2**: 161. 1918. (hyponym.)

On dung, Porto Rico:—endemic.

Resembling the preceding but differing in the spores being subglobose, $17 \times 20\ \mu$.

3. **Saccobolus violascens** Boud. Ann. Sci. Nat. V. **10**: 230. 1869.

Cultivated on goat dung from Porto Rico:—continental North America; Europe.

Family 3. **GEOGLOSSACEAE.**

1. **GEOGLOSSUM** Pers. Neues Mag. Bot. **1**: 116. 1794.

1. **Geoglossum nigritum** (Pers.) Cooke, Mycographia 205, *pl. 96, f. 345.* 1879.

On soil, Porto Rico:—Bermuda; continental North America.

Very common in Bermuda but apparently rare in Porto Rico, so far as our experience has gone.

2. **Geoglossum pumilum** Winter, Grevillea **15**: 91. 1886.

On the ground, Porto Rico:—Bermuda; continental South America.

Two minute plants of this species were obtained by us in Bermuda. A similar collection was made in Porto Rico where a diligent search failed to reveal more than the two plants.

## Family 4. **HELOTIACEAE.**

### 1. **CIBORIA** Fuckel, Symb. Myc. 311. 1869.

1. **Ciboria caespitosa** Seaver, Mycologia **17**: 48. 1925.

On some wood, Porto Rico:—endemic.

2. **Ciboria** sp.

Reported on old branches, St. Thomas:—

### 2. **DASYSCYPHA** (Fries) Fuckel, Symb. Myc. 304. 1869.

1. **Dasyscypha Dicranopteridis** Seaver & Whetzel, sp. nov.

Apothecia scattered, hypophyllous, shortly stipitate or subsessile, externally reddish, turning purple with KOH, densely clothed with white hairs, reaching a diameter of .5 mm. and of about equal height; hairs cylindrical, roughened on the outside; asci clavate, 8-spored, 40–50 × 5 $\mu$, attenuated below into a rather long stem-like base; spores fusiform with the ends acute and almost bristle-like, not distinctly septate, although often with a suggestion of septa, 10–11 × 2 $\mu$.

On *Dicranopteris pectinata* (Willd.) Underw. [*Gleichenia pectinata* Willd.]. Fincamaria, (mountains above Yauco), June 18, 1924.

This is closely related to *Dasyscypha Ulei* (Winter) Sacc., an authentic specimen of which has been examined (*Peziza Ulei* Winter, Rabenh.–Winter, Fungi Eur. *3273*), which was described from South America on living fronds of *Gleichenia dichotoma*. Our species differs from the Brazil plant in the much smaller size of the asci and spores.

Whetzel, Kern & Toro *2683*—C. U. Herb. *14742*.

2. **? Dasyscypha flavidula** Rehm, Ann. Myc. **7**: 542. 1909.

On dead stems, Porto Rico:—endemic.

### 3. **ERINELLA** Quél. Ench. Fung. 301. 1886.

1. **Erinella similis** Bres. Hedwigia **35**: 296. 1896.

On wood, Porto Rico:—continental South America.

### 4. **HELOTIUM** Fries, Summa Veg. Scand. 354. 1849.

1. **Helotium citrinum** (Hedw.) Fries, Summa Veg. Scand. 354. 1849.

*Octospora citrina* Hedw. Descr. **2**: 28. 1788.

Reported on dead wood, Porto Rico:—continental North America; Europe; New Zealand. Probably widely distributed.

### 5. **PHIALEA** (Pers.) Gill. Champ. Fr. Discom. 93. 1879.

1. **Phialea Cecropiae** (P. Henn.) Seaver, Mycologia **17**: 50. 1925.

*Helotium Cecropiae* P. Henn. Hedwigia **41**: 25. 1902.

On leaf sheaths of *Cecropia*, Porto Rico:—endemic.

2. **Phialea microspora** Seaver, Mycologia **17**: 50. 1925.
On undetermined leaves, Porto Rico:—endemic.

6. **TRICHOPEZIZA** Fuckel, Symb. Myc. 195. 1869.

1. **Trichopeziza episphaeria** (Mart.) Lamb. Myc. Belg. **2**: 524. 1880.
*Peziza episphaeria* Mart. Fl. Erlang. 465. 1817.
On *Hypoxylon rubiginosum* (Pers.) Fries, St. Jan:—Europe.

## Family 5. **MOLLISIACEAE.**

1. **BELONIDIUM** Mont. & Dur.; De-Not. Comm. Critt. Ital. **1**: 380. 1863.

1. **Belonidium leucorrhodinum** (Mont.) Sacc. Syll. Fung. **8**: 501. 1889.
*Peziza leucorrhodina* Mont. Pl. Cell. Cuba 360. 1842.
*Peziza gelatinosa* Ellis & Mart. Am. Nat. **17**: 1283. 1883.
On Perisporiaceae on various hosts, Porto Rico:—continental South America.
Reported from the Fink collection by Petrak under the name of *Calloria gelatinosa* (Ellis & Mart.) Durand.

2. **NIPTERA** Fries, Summa Veg. Scand. 359. 1849.

1. **Niptera subiculata** Seaver, Mycologia **16**: 8. 1924.
On a black subiculum on rotten stick, St. Thomas:—endemic.

3. **ORBILIA** Fries, Summa Veg. Scand. 357. 1849.

1. **Orbilia chrysocoma** (Bull.) Sacc. Syll. Fung. **8**: 624. 1889.
*Peziza chrysocoma* Bull. Champ. Fr. **1**: 254. 1809.
On dead wood, Porto Rico:—continental North America; Europe.

4. **TRICHOBELONIUM** Sacc. Syll. Fung. **16**: 747. 1902.

1. **Trichobelonium albosuccineum** Rehm, Hedwigia **39**: 89. 1900.
On leaves, Porto Rico:—continental South America.

## Family 6. **PATELLARIACEAE.**

1. **BACTROSPORA** Massal. Ricerche Aut. Lich. Crost. 133. 1852.

**Bactrospora integrispora** Seaver, Mycologia **16**: 8. 1924.
On decorticated wood, St. Thomas:—endemic.

2. **IONOMIDOTIS** Durand, Proc. Am. Acad. Sci. **59**: 8. 1923.

**Ionomidotis portoricensis** Seaver, Mycologia **17**: 50. 1925.
On dead wood, Porto Rico:—endemic.

3. **KARSCHIA** Koerber, Parerga Lich. 459. 1865.

**Karschia lignyota** (Fries) Sacc. Syll. Fung. **8**: 779. 1889.
*Patellaria lignyota* Fries, Syst. Myc. **2**: 150. 1822.
On dead wood, Porto Rico:—continental North America; Europe.

4. **MIDOTIS** Fries, Summa Veg. Scand. 362. 1849.

1. **Midotis heteromera** Mont. Syll. Crypt. 189. 1856.

On wood, Porto Rico:—Cuba.
Reported from the Sintenis collection.

1. **PATELLARIA** Fries, Syst. Myc. **2**: 158. 1822.

1. **Patellaria atrata** (Hedw.) Fries, Syst. Orbis Veg. 113. 1825.

*Lichen atratus* Hedw. Descr. **2**: 73. 1789.
On wood, Porto Rico:—widely distrlbuted.

2. **Patellaria cyanea** Cooke, Jour. Linn. Soc. **17**: 142. 1880.

*Lecanidion cyaneum* Sacc. Syll. Fung. **8**: 801. 1889.
On dead citrous twigs, Porto Rico:—continental North America.

3. **Patellaria Finkii** Petrak, Ann. Myc. **21**: 309. 1923.

On wood, Porto Rico:—endemic.

## Family 7. CENANGIACEAE.

1. **DERMATEA** Fries, Summa Veg. Scand. 362. 1849.

1. **Dermatea dimorpha** Seaver, Mycologia **16**: 8. 1924.

On dead wood and branches, St. Thomas:—endemic.

## Order 13. HYSTERIALES.

Apothecia immersed in the substratum. Fam. 1. HYPODERMATACEAE.
Apothecia becoming superficial. Fam. 2. HYSTERIACEAE.

## Family 1. HYPODERMATACEAE.

1. **LOPHODERMIUM** Chev. Fl. Paris **1**: 435. 1836.

1. **Lophodermium Mangiferae** Koord. Bot. Untersuch. 163. 1907.

On *Mangifera indica* L., Porto Rico:—Java.

2. **Lophodermium platyplacum** (Berk. & Curt.) Sacc. Syll. Fung. **2**: 792. 1883.

*Hysterium platyplacum* Berk. & Curt. Jour. Linn. Soc. **10**: 372. 1869.
On *Clusia* sp., Porto Rico:—Cuba; Trinidad.

## Family 2. HYSTERIACEAE.

1. **GLONIELLA** Sacc. Syll. Fung. **2**: 765. 1883.

1. **Gloniella rubra** Stevens, Bot. Gaz. **69**: 254. 1920.

On *Arthrostylidium multispicatum* Pilger, Porto Rico:—endemic.

2. **GLONIOPSIS** De-Not. Giorn. Bot. Ital. $2^2$: 23. 1851.

1. **Gloniopsis guttulata** Seaver, Mycologia **16**: 9. 1924.

On decorticated wood, St. Thomas:—endemic.

3. **GLONIUM** Muehl.; Schw. Schr. Nat. Ges. Leipzig **1**: 50. 1822.

1. **Glonium clavisporum** Seaver, Mycologia **17**: 4. 1925.

On wood, Porto Rico; St. Croix:—Nicaragua.

*Glonium simulans* f. *macrospora* as noted in Mycologia (l.c.) is apparently the same.

2. **Glonium parvulum** (Ger.) Sacc. Syll. Fung. **2**: 735. 1883.

*Hysterium parvulum* Ger. Bull. Torrey Bot. Club **5**: 40. 1874.

On dead citrous stump, Porto Rico:—continental North America.

4. **HYSTERIUM** Tode, Fungi Meckl. **2**: 3. 1791.

1. **Hysterium Calabash** Seaver, Mycologia **16**: 9. 1924.

On the surface of dried calabash fruit, St. Thomas:—endemic.

5. **OSTREIONELLA** Seaver, gen. nov.

Perithecia superficial similar to those of the genus *Ostreion;* asci clavate, 8-spored; spores 2-celled, fusoid, constricted at the septum, pale-brown.

1. **Ostreionella fusispora** Seaver, sp. nov.

Perithecia moderately large, reaching a length of 1 mm., bilaterally more or less compressed, lips tightly compressed; asci reaching a length of 150 $\mu$ tapering gradually into a stem-like base; spores 18–20 $\times$ 5–6$\mu$.

Type collected by E. G. Britton on rotten wood, March 15, 1925, Cidra, Porto Rico:—endemic.

6. **PSILOGLONIUM** Höhn. Ann. Myc. **16**: 149. 1918.

1. **Psiloglonium Finkii** Petrak, Ann. Myc. **21**: 308. 1923.

On sticks, Porto Rico:—endemic.

Order 14. **PHACIDIALES.**

Apothecia soft, fleshy. Fam. 1. Stictidaceae.
Apothecia hard, carbonaceous. Fam. 2. Phacidiaceae.

Family 1. **STICTIDACEAE.**

1. **CRYPTODISCUS** Corda, Ic. Fung. **2**: 37. 1838.

1. **Cryptodiscus subreticulatus** (Berk. & Br.) Sacc. Syll. Fung. **8**: 673. 1889.

*Platygrapha subreticulata* Berk. & Br. Jour. Linn. Soc. **14**: 109. 1875.

On bark, Porto Rico:—Ceylon.

2. **COCCOMYCES** De-Not. Giorn. Bot. Ital. **2**: 38. 1847.

1. **Coccomyces Clusiae** (Lév.) Sacc. Syll. Fung. **8**: 747.1889.

*Phacidium Clusiae* Lév. Ann. Sci. Nat. IV. **20**: 291. 1863.

On *Clusia rosea* Jacq., Porto Rico:—continental South America.

2. **Coccomyces Musae** (Lév.) Sacc. Syll. Fung. **8**: 752. 1889.

*Pacidium Musae* Lév. Ann. Sci. Nat. IV. **20**: 291. 1863.

On *Musa* sp., Porto Rico:—continental South America.

3. **STICTIS** Pers. Obs. Myc. **2**: 73. 1796.

1. **Stictis foliicola** Berk. & Curt. Jour. Linn. Soc. **10**: 371. 1868.
On dead leaves, *Clusia* sp., Porto Rico:—Cuba.

2. **Stictis radiata** Pers. Obs. Myc. **2**: 73. 1799.
*Lycoperdon radiatum* L. Sp. Pl. ed. 2, 1654. 1763.
On dead citrous twigs, Porto Rico:—continental North America; Europe; Australia; Africa; Tasmania.

4. **TRIBLIDIUM** Dufour, Ann. Sci. Nat. I. **13**: 321. 1828.

1. **Triblidium rufulum** (Spreng.) Ellis & Ev. N. Am. Pyrenom. 690. 1892.
*Hysterium rufulum* Spreng. Vet. Akad. Handl. **1820**: 50.
On dead sticks and twigs, Porto Rico; St. Thomas:—Cuba; Jamaica; Bahamas; Bermuda; continental America.

## Family 2. PHACIDIACEAE.

1. **GRIGGSIA** Stevens & Dalbey, Bot. Gaz. **68**: 224. 1919.

1. **Griggsia cyathea** Stevens & Dalbey, Bot. Gaz. **68**: 224. 1919.
On *Cyathea arborea* (L.) J. E. Sm., Porto Rico:—endemic.
The systematic position of this species is somewhat doubtful but the author of the species suggests that it might be placed in the above family.

## Sub-class 3. DEUTEROMYCETES.

Conidia produced in perithecium-like bodies known as pycnidia. — Order 1. PHYLLOSTICTALES.
Conidia not produced in pycnidia.
  Conidia in layers which are freely exposed at maturity. — Order 2. MELANCONIALES.
  Conidia on conidiophores which are single or collected into tufts. — Order 3. HYPHOMYCETALES.

## Order 1. PHYLLOSTICTALES.

Pycnidia more or less globose or flask-shaped.
  Pycnidial wall black, membranaceous, leathery or carbonaceous. — Fam. 1. PHYLLOSTICTACEAE.
  Pycnidial wall and stroma bright colored, fleshy or waxy. — Fam. 2. ASCHERSONIACEAE.
Pycnidia not globose or flask-shaped.
  Pycnidia more or less superficial, shield-shaped, opening with a slit-like aperture. — Fam. 3. LEPTOSTROMATACEAE.
  Pycnidia more or less scutellate, at first closed, the fruiting surface finally freely exposed. — Fam. 4. EXCIPULACEAE.

## Family 1. PHYLLOSTICTACEAE.

1. **ACTINONEMA** Fries, Summa Veg. Scand. 424. 1849.

1. **Actinonema Rosae** (Lib.) Fries, Summa Veg. Scand. 424. 1849.
*Asteroma Rosae* Lib. Mem. Linn. Soc. Paris **5**: 405. 1827.
On leaves of *Rosa* sp., Porto Rico:—continental North America; Europe.
The perfect stage *Diplocarpon Rosae* Wolf (Bot. Gaz. **54**: 231. 1912) not known from Porto Rico.

2. **ASCOCHYTA** Lib. (p. p.); Sacc. Giorn. Bot. Ital. **7**: 302. 1875.

1. **Ascochyta Nicotianae** Pass. Att. Critt. Ital. **3**: 14. 1881.
On *Nicotiana Tabacum* L., Porto Rico:—Europe.

3. **CICINNOBOLUS** Ehr. Bot. Zeit. **11**: 16. 1853.

1. **Cicinnobolus Cesatii** DeBary, Abh. Senckenb. Ges. Nat. **7**: 431. 1870.
On *Erysiphe Polygoni* ? on *Emelista tora* (L.) Britton & Rose, *Cassia* sp., Porto Rico; St. Croix; *Sida* sp., St. Jan:—Europe; Africa.

4. **CONIOTHYRIUM** Corda, Ic. Fung. **4**: 38. 1840.

1. **Coniothyrium Marisci** Tehon, Bot. Gaz. **67**: 508, 1919.
On *Mariscus jamaicensis* (Crantz) Britton, Porto Rico:—endemic.

5. **CRYPTOSTICTIS** Fuckel, Fung. Rhen. *1838*. 1866.

1. **Cryptostictis hysterioides** Fuckel, Fungi Rhen. *1838*. 1869.
*Hendersonia hysterioides* Fuckel, Symb. Myc. 392. 1869.
On dead leaves, Porto Rico:—Europe.

6. **CYTOSPORA** Ehr. Sylv. Myc. Berol. 28. 1818.

1. **Cytospora Sacchari** Butler, Mem. Dept. Agr. Ind. $1^3$: 30. 1906.
On dead and dying sugar cane, leaf-sheaths and stalks, Porto Rico:—India.

7. **DARLUCA** Cast. Cat. Pl. Suppl. 53. 1851.

1. **Darluca Filum** (Biv.) Sacc. Syll. Fung. **3**: 410. 1884.
*Sphaeria Filum* Biv. Stirp. Rar. Manip. **3**: 12. 1815.
*Darluca vagans* Cast. Cat. Pl. Suppl. 53. 1851.
On plant rusts, Porto Rico; St. Croix; St. Thomas:—continental North America; Europe; Ceylon; Africa.

8. **DIPLODIA** Fries, Summa Veg. Scand. 416. 1849.

1. **Diplodia cacaoicola** P. Henn. Bot. Jahrb. **22**: 80. 1895.
On *Saccharum officinarum* L. and *Theobroma Cacao* L., Porto Rico:—Africa.

2. **Diplodia natalensis** Evans, Transv. Dept. Agr. Bull. **4**: 15. 1910.
On *Citrus* sp., Porto Rico:—continental Africa.

3. **Diplodia Opuntiae** Sacc. Michelia **2**: 267. 1881.
On *Opuntia* sp., Porto Rico:—Europe.

4. **Diplodia tubericola** (Ellis & Ev.) Taub. Del. Exp. Station Bull. **109**: 27. 1915.
*Lasiodiplodia tubericola* Ellis & Ev. Bot. Gaz. **21**: 92. 1896.
On *Ipomoea Batatas* (L.) Lam., Porto Rico:—continental North America.

9. **DOTHIORELLA** Sacc. Michelia **2**: 5. 1880.

1. **Dothiorella pseudodiblasta** Ferd. & Winge, Vidensk. Meddel. **1908**: 144.
On living stems of *Scleria* sp., St. Jan:—endemic.

10. **MELOPHIA** Sacc. Syll. Fung. **3**: 658. 1884.

1. **Melophia Eugeniae** Ferd. & Winge, Bot. Tidssk. **29**: 20. 1908.
On living leaves of *Eugenia* sp., St. Thomas:—endemic.

11. **PHOMA** Fries, Summa Veg. Scand. 421. 1849.

1. **Phoma destructiva** Plowr. Gard. Chron. **16**: 621. 1881.
On *Lycopersicon Lycopersicon* (L.) Karst. [*Lycopersicon esculentum* Mill.], Porto Rico:—Europe.

2. **Phoma Foucroyae** Thüm. Contr. Myc. Lus. No. *332*. 1879.
On *Fucraea tuberosa* Ait., Porto Rico:—Europe.

3. **Phoma lathyrina** Sacc. Michelia **2**: 274. 1881.
On pods of *Albizzia Lebbeck* (L.) Benth., Porto Rico:—Europe.

4. **Phoma Leonotidis** Seaver, Mycologia **16**: 9. 1924.
On dead stems of *Leonotis nepetaefolia* (L.) R. Br., St. Thomas:—endemic.

12. **PHOMOPSIS** Sacc. Ann. Myc. **3**: 166. 1905.

1. **Phomopsis Citri** Fawcett, Phytopathology **2**: 109. 1912.
On species of *Citrus*, Porto Rico:—continental North America.

2. **Phomopsis vexans** (Sacc. & Syd.) Harter, Jour. Agr. Res. **2**: 338. 1914.
*Phoma vexans* Sacc. & Syd. in Sacc. Syll. Fung. **14**: 889. 1899.
On *Solanum Melongena* L., Porto Rico:—continental North America.

13. **PHYLLOSTICTA** Pers. Champ. Comest. 55, 147. 1819.

1. **Phyllosticta adianticola** Young, Mycologia **7**: 144. 1915.
On *Adiantum tenerum* Sw., Porto Rico:—endemic.

2. **Phyllosticta Apii** Halst. Rep. N. J. Agr. Exp. Sta. **12**: 253. 1891.
On *Celeri graveolens* (L.) Britton [*Apium graveolens* L.], Porto Rico:—continental North America.

3. **Phyllosticta araliana** Young, Mycologia **7**: 148. 1915.
On *Dendropanax arboreum* (L.) Dcne. & Pl., Porto Rico:—endemic.

4. **Phyllosticta Batatas** (Thüm.) Cooke, Grevillea **7**: 35. 1878.
*Depazea Batatas* Thüm. Myc. Univ. *598*. 1876.
On *Ipomoea Batatas* (L.) Lam., Porto Rico:—Europe; continental North America.

5. **Phyllosticta bixina** Young, Mycologia **7**: 148. 1915.
On *Bixa Orellana* L., Porto Rico:—endemic.

6. **Phyllosticta bonduc** Stevens, Bot. Gaz. **69**: 256. 1920.
On *Guilandina Bonduc* L. [*Caesalpinia Bonduc* Roxb.], Porto Rico:—endemic.

7. **Phyllosticta borinquensis** Young, Mycologia **7**: 147. 1915.
On *Helicteres jamaicensis* Jacq., Porto Rico:—endemic.

8. **Phyllosticta cissicola** Speg. Anal. Mus. Nac. Buenos Aires III. **13**: 332. 1911.
On *Cissus sicyoides* L., Porto Rico:—continental North America.

9. **Phyllosticta citrullina** Chester, Bull. Torrey Club **18**: 374. 1891.
Reported on *Cucumis Melo* L. ?, Porto Rico:—continental North America.

10. **Phyllosticta Clusiae** Stevens, Trans. Ill. Acad. Sci. **10**: 195. 1915.
On *Clusia rosea* Jacq., Porto Rico:—endemic.

11. **Phyllosticta Coccolobae** Ellis & Ev. Ann. Rep. Missouri Bot. Garden **9**: 118. 1898.
On *Coccolobis uvifera* (L.) Jacq., Porto Rico:—West Indies.

12. **Phyllosticta Colocasiae** Höhn. Sitz.-ber. Akad. Wien **116**: 142. 1907.
*Dieffenbachia seguine* (Jacq.) Schott., Porto Rico:—Samoa.

13. **Phyllosticta colocasicola** Höhn. Sitz.-ber. Akad. Wien **116**: 142. 1907.
On *Caladium* [*Colocasia* sp.], Porto Rico:—Samoa.

14. **Phyllosticta commelinicola** Young, Mycologia **7**: 144. 1915.
On *Commelina longicaulis* Jacq. Porto Rico:—endemic.

15. **Phyllosticta Cucurbitacearum** Sacc. Michelia **1**: 145. 1878.
On *Cucumis sativus* L., Porto Rico:—continental North America; Europe.

16. **Phyllosticta desmodiiphila** Speg. Bol. Acad. Ci. Cordoba **26**: 362. 1923.
On living leaves of *Meibomia* (*adscendens* ?), Porto Rico:—endemic.

17. **Phyllosticta divergens** Sacc. Malpighia **5**: 281. 1891.
On *Albizzia Lebbeck* (L.) Benth., Porto Rico:—Europe.

18. **Phyllosticta erythrinicola** Young, Mycologia **7**: 146. 1915.
On *Erythrina Poeppigiana* (Walp.) O. F. Cook [*Erythrina micropteryx* Poepp.], Porto Rico:—endemic.

19. **Phyllosticta Eugeniae** Young, Mycologia **7**: 148. 1915.
On *Eugenia buxifolia* (Sw.) Willd., Mona Island:—endemic.

20. **Phyllosticta eupatoriicola** Kab. & Bub. Hedwigia **46**: 288. 1907.
On *Osmia odorata* (L.) Sch. Bip. [*Eupatorium odoratum* L.], Porto Rico:—Europe.

21. **Phyllosticta glaucispora** Delacr. Bull. Soc. Myc. Fr. **9**: 266. 1893.

On *Urechites lutea* (L.) Britton, Mona Island:—Europe.

22. **Phyllosticta guanicensis** Young, Mycologia **7**: 146. 1915.

On *Guilandina Crista* (L.) Small, Porto Rico:—endemic.

23. **Phyllosticta Guareae** P. Henn. Hedwigia **41**: 113. 1902.

On *Guarea Guara* (Jacq.) P. Wilson, Porto Rico:—continental South America.

24. **Phyllosticta hibiscina** Ellis & Ev. Jour. Myc. **4**: 9. 1888.

On *Abutilon umbellatum* (L.) Sweet, Mona Island:—continental North America.

25. **Phyllosticta Hortorum** Speg. Att. Soc. Critt. Ital. **3**: 67. 1881.

Referred to *Phomopsis vexans* (Sacc. & Syd.) Harter.

26. **Phyllosticta Ipomoeae** Ellis & Kellerm. Jour. Myc. **3**: 102. 1887.

On *Exogonium repandum* (Jacq.) Choisy, Porto Rico:—Bermuda ?; continental North America.

27. **Phyllosticta Lantanae** Stevens, Trans. Ill. Acad. Sci. **10**: 195. 1917.

On *Lantana involucrata* L. [*Lantana odorata* L.], Porto Rico:—endemic. The name is preoccupied and if the species is distinct should be renamed.

28. **Phyllosticta maculicola** Halst. Rep. N. J. Agr. Exp. Sta. **14**: 412. 1894.

On *Dracaena terminalis* L. [*Cordyline terminalis* Kth.], Porto Rico:—continental North America; Europe.

29. **Phyllosticta Malkoffii** Bubak, Ann. Myc. **6**: 24. 1908.

On *Gossypium barbadense* L., Porto Rico:—Europe.

30. **Phyllosticta momisiana** Young, Mycologia **7**: 145. 1915.

On *Momisia iguanaea* (Jacq.) Rose & Stanley, Porto Rico:—endemic.

31. **Phyllosticta pandanicola** Young, Mycologia **7**: 150. 1915.

On *Pandanus* sp., Porto Rico:—endemic.

32. **Phyllosticta Panici** Young, Mycologia **7**: 144. 1915.

On *Panicum maximum* Jacq., Porto Rico:—endemic.

33. **Phyllosticta Pithecolobii** Young, Mycologia **7**: 145. 1915.

On *Pithecellobium Unguis-cati* (L.) Mart., Porto Rico:—endemic.

34. **Phyllosticta Pithecolobii** var. **monensis** Young, Mycologia **7**: 145. 1915.

On *Pithecellobium Unguis-cati* (L.) Mart., Mona Island:—endemic.

35. **Phyllosticta portoricensis** Young, Mycologia **7**: 147. 1915.

On *Croton lucidus* L., Porto Rico:—endemic.

36. **Phyllosticta Sacchari** Speg. Rev. Agr. Univ. La Plata **1896:** 239.
On *Saccharum officinarum* L., Porto Rico:—continental South America.

37. **Phyllosticta Sechii** Young, Mycologia **7:** 149. 1915.
On *Sechium edule* (Jacq.) Sw., Porto Rico:—endemic.

38. **Phyllosticta Stevensii** Young, Mycologia **7:** 147. 1915.
On *Triumfetta semitriloba* Jacq., Porto Rico:—endemic.

39. **Phyllosticta superficiale** Stevens, Trans. Ill. Acad. Sci. **10:** 195. 1917.
On *Passiflora sexflora* Juss., Porto Rico:—endemic.

14. **PSEUDODIPLODIA** (Karst.) Sacc. Syll. Fung. **3:** 621. 1884.

1. **Pseudodiplodia Xylariae** Ferd. & Winge, Bot. Tidssk. **29:** 21. 1908.
On *Xylaria* sp., St. Jan:—endemic.

15. **SEPTORIA** Fries, Syst. Myc. **3:** 480. 1832.

1. **Septoria asiatica** Speg. Rev. Agr. Univ. La Plata **6:** 168. 1910.
On *Centella asiatica* (L.) Urban, Porto Rico:—continental South America.

2. **Septoria Chelidonii** Desm. Ann. Sci. Nat. II. **17:** 110. 1842.
On *Argemone mexicana* L., Porto Rico:—Europe.

3. **Septoria Fici-indicae** Vogl. Ann. R. Acad. Agr. Tor. **1904:** 401.
On *Opuntia Dillenii* (Ker-Gawl.) Haw., Porto Rico:—Europe.

4. **Septoria Guettardae** Garman, Mycologia **7:** 334. 1915.
On *Guettarda ovalifolia* Urban, Porto Rico:—endemic.

5. **Septoria Lantanae** Garman, Mycologia **7:** 334. 1915.
On *Lantana Camara* L., Porto Rico:—endemic.

6. **Septoria Lycopersici** Speg. Anal. Soc. Ci. Argent. **12:** 115. 1881.
On *Lycopersicon Lycopersicon* (L.) Karst., Porto Rico:—continental America.

7. **Septoria Miconiae** Garman, Mycologia **7:** 333. 1915.
On *Miconia laevigata* (L.) DC., *M. impetiolaris* (Sw.) D. Don, Porto Rico:—endemic.

8. **Septoria Mikaniae** Winter, Grevillea **15:** 92. 1887.
On *Mikania* sp., Porto Rico:—continental South America.

9. **Septoria Petitae** Garman, Mycologia **7:** 333. 1915.
On *Petitia domingensis* Jacq., Porto Rico:—endemic.

10. **Septoria Petroselini** var. **Apii** Briosi & Cav. Fungi Parass. *144*. 1891.

On *Celeri graveolens* (L.) Britton,Porto Rico:—continental North America; Europe; Africa.

11. **Septoria Pityrogrammae** Garman, Mycologia **7**: 334. 1915.

On *Pityrogramma calomelanos* (L.) Link, Porto Rico:—endemic.

12. **Septoria Rosae** Desm. Crypt. Fr. *535*. 1831.

On *Rosa* sp., Porto Rico:—Europe.

13. **Septoria rufomaculans** Berk. Gard. Chronicle **1854**: 676. 1854.

See *Glomerella rufomaculans*.

16. **CERCOSEPTORIA** Petrak, Ann. Myc. **23**: 69. 1925.

*Septoriopsis* Stevens & Dalbey, Mycologia **11**: 4. 1919. Not Frag. & Paul. 1915.

1. **Cercoseptoria Chamaesyceae** (Stevens & Dalbey) Petrak, l. c.

*Septoriopsis Chamaesyceae* Stevens & Dalbey, Mycologia **11**: 4. 1919.

On *Chamaesyce hypericifolia* (L.) Millsp., Porto Rico:—endemic.

2. **Cercoseptoria Piperis** (Stevens & Dalbey) Petrak, Ann. Myc. **23**: 69. 1925.

*Septoriopsis Piperis* Stevens & Dalbey, Mycologia **11**: 5. 1919.

*Ramularia cylindrosporioides* Stevens; Stevenson, Jour. Dept. Agr. Porto Rico **2**: 209. 1918. (hyponym).

On *Piper Amalago* L. [*Piper medium* Jacq.], Porto Rico:—endemic.

17. **VERMICULARIA** Fries, Summa Veg. Scand. 419. 1849.

1. **Vermicularia atricha** Ellis & Ev. Field Museum Pub. Bot. Series **2**: 16. 1900.

On *Petiveria alliacea* L., Porto Rico:—endemic.

2. **Vericularia graminicola** West. Bull. Acad. Belg. II. **2**: 566. 1857.

On dead cane stalks, Porto Rico:—Europe.

## Family 2. **ASCHERSONIACEAE.**

1. **ASCHERSONIA** Mont. Ann. Sci. Nat. III. **10**: 121. 1848.

1. **Aschersonia Aleyrodis** Webber, U. S. Dept. of Agr. Div. Phys. & Path. Bull. **13**: 20. 1897.

On *Aleurodiscus minimus*, the white fly of *Psidium Guajava* L., Porto Rico:—continental North America.

2. **Aschersonia flavo-citrina** P. Henn. Hedwigia **41**: 307. 1902.

On *Aleurodiscus minimus*, Porto Rico:—continental South America.

3. **Aschersonia cubensis** Berk. & Curt. Jour. Linn. Soc. **10**: 351. 1868.

On scale insects on various hosts, Porto Rico:—Cuba.

4. **Aschersonia turbinata** Berk. Ann. Mag. Nat. Hist. II. **9**: 199. 1852.
Conidial stage of *Hypocrella turbinata* (Berk.) Petch.

2. **ZYTHIA** Fries, Syst. Orbis Veg. 118. 1825.

1. **Zythia Phaseoli** Stevens; Stevenson, Jour. Dept. Agr. Porto Rico **2**: 204. 1918.
Conidial stage of *Phyllachora Phaseoli* (P. Henn.) Theiss. & Syd.

## Family 3. LEPTOSTROMATACEAE.

1. **LEPTOTHYRIUM** Kunze; Kunze & Schm. Myk. Hefte **2**: 79. 1823.

1. **Leptothyrium Pomi** (Mont.) Sacc. Michelia **2**: 113. 1880.
*Labrella Pomi* Mont. Ann. Sci. Nat. II. **1**: 347. 1834.
On *Citrus sinensis* (L.) Osbeck, Porto Rico:—continental North America; Europe.

2. **MELASMIA** Lév. Ann. Sci. Nat. III. **5**: 276. 1846.

1. **Melasmia Coccolobis** Stevens, Trans. Ill. Acad. Sci. **10**: 197. 1917.
On *Coccolobis* sp., Porto Rico:—endemic.

2. **Melasmia Ingae** Stevens, Trans. Ill. Acad. Sci. **10**: 197. 1917.
On *Inga laurina* (Sw.) Willd., Porto Rico:—endemic.

## Family 4. EXCIPULACEAE.

1. **EPHELIS** Fries, Summa Veg. Scand. 370. 1849. Jour. Linn. Soc. **10**: 353. 1868.

1. **Ephelis mexicana** Fries; Berk. & Curt. Jour. Linn. Soc. **10**: 353. 1868.
Conidial stage of *Balansia Hypoxylon* (Peck.) Atkinson.

## Order 2. MELANCONIALES.

## Family 1. MELANCONIACEAE.

1. **COLLETOTRICHUM** Corda in Sturm, Deuts. Fl. Pilze **3**: 41. 1837.

1. **Colletotrichum coffeanum** Noack, Zeit. Pflanzenkr. **11**: 202. 1901.
On *Coffea arabica* L., Porto Rico:—continental South America.

2. **Colletotrichum Cradwickii** Bancroft, West Indian Bull. **10**: 251. 1910.
On *Theobroma Cacao* L., Porto Rico:—Jamaica.

3. **Colletotrichum curvisetum** Stevens, Trans. Ill. Acad. Sci. **10**: 199. 1917.
On *Hura crepitans* L., Porto Rico:—endemic.

4. **Colletotrichum Erythrinae** Ellis & Ev. Bull. Torrey Club **22**: 437. 1895.
On *Pithecellobium Unguis-cati* (L.) Mart., Porto Rico:—continental North America.

5. **Colletotrichum falcatum** Went, Meded. Proefst. Suik. West Java **7**: 7. 1893.
On *Saccharum officinarum* L., Porto Rico:—Java.
Usually on dead or dying leaves but occasionally a wound parasite on the stalk.

6. **Colletotrichum gloeosporioides** (Penz.) Sacc. Syll. Fung. **3**: 735. 1884.

*Vermicularia gloeosporioides* Penz. Michelia **2**: 450. 1882.

On *Citrus* sp., *Mangifera indica* L., and *Persea Persea* (L.) Cockerell [*Persea gratissima* Gaertn.], Porto Rico:—Europe.

7. **Colletotrichum Higginsianum** Sacc.; Higgins, Jour. Agr. Res. **10**: 161. 1917.

On *Brassica campestris* L. [*Brassica rapa* L.], Porto Rico:—continental North America.

8. **Colletotrichum lagenarium** (Pass.) Ellis & Halst. N. J. Agr. Exp. Sta. Rep. **14**: 351. 1893.

*Fusarium lagenarium* Pass. Boll. Comiz. Agron. Ital. II. No. 148.

On *Cucumis sativus* L., *C. Melo* L., Porto Rico:—continental North America; Europe.

9. **Colletotrichum Lindemuthianum** (Sacc. & Magn.) Briosi & Cav. Funghi Parass. *50*. 1889.

*Gloeosporium Lindemuthianum* Sacc. & Magn. Michelia **1**: 129. 1878.

On *Phaseolus vulgaris* L., *Cucurbita Melo* L., Porto Rico:—Europe.

10. **Colletotrichum lineola** Corda in Sturm, Deuts. Fl. Pilze **3**: 41. 1837.

On *Holcus halepensis* L., *H. Sorghum* L., Porto Rico:—Europe.

11. **Colletotrichum Lobeliae** Stevens, Trans. Ill. Acad. Sci. **10**: 198. 1917.

On *Tupa robusta* (Graham) A. DC. [*Lobelia assurgens* L. var. *portoricensis* Urban], Porto Rico:—endemic.

12. **Colletotrichum nigrum** Ellis & Halst. N. J. Agr. Exp. Sta. Rep. **11**: 359. 1891.

On *Capsicum annuum* L., Porto Rico:—continental North America.

13. **Colletotrichum omnivorum** Halst. N. J. Agr. Exp. Sta. Rep. **12**: 293. 1892.

On *Pandanus* sp., Porto Rico:—continental North America.

14. **Colletotrichum Philodendri** P. Henn. Hedwigia **44**: 71. 1905.

On *Philodendron Krebsii* Schott, Porto Rico:—continental South America.

15. **Colletotrichum phomoides** (Sacc.) Chester, Rep. Del. Agr. Exp. Sta. **6**: 112. 1893.

*Gloeosporium phomoides* Sacc. Michelia **2**: 540. 1882.

On *Lycopersicon Lycopersicon* (L.) Karst., Porto Rico:—continental North America.

16. **Colletotrichum Piperis** Stevens, Trans. Ill. Acad. Sci. **10**: 198. 1917.

On *Pothomorphe peltata* (L.) Miq., Porto Rico:—endemic.

2. **GLOEOSPORIUM** Desm. & Mont. Ann. Sci. Nat. III. **12**: 395. 1849.

1. **Gloeosporium Hemerocallidis** Ellis & Ev.; Stevenson, Jour. Dept. Agr. Porto Rico **2**: 205. 1918.

On *Hymenocallis declinata* (Jacq.) M. Roem., Porto Rico:—endemic.

The fungus causes reddish spots on the leaves. The spores are described as 4–5 × 12–15 $\mu$. While the species has been listed no published description has been seen.

2. **Gloeosporium Manihotis** P. Henn. Not. Bot. Gard. Mus. Berlin **3**: 241. 1903.

On *Manihot Manihot* (L.) Cockerell, Porto Rico:—East Africa.

*Gloeosporium Manihot* Earle, which is listed for Porto Rico by Stevenson, is doubtless the same although no published description has been seen.

3. **Gloeosporium Melongenae** Ellis & Halst. N. J. Agr. Exp. Sta. Rep. **12**: 281. 1892.

On *Solanum Melongena* L., Porto Rico:—continental North America.

4. **Gloeosporium Musarum** Cooke & Massee, Grevillea **16**: 3. 1887.

On *Musa paradisiaca* L., Porto Rico:—Australia.

5. **Gloeosporium piperatum** Ellis & Ev. N. J. Agr. Exp. Sta. Rep. **11**: 358. 1891.

See *Glomerella piperata*.

6. **Gloeosporium Psidii** G. Del. Bull. Soc. Myc. Fr. **19**: 143. 1903.

See *Glomerella rufomaculans*.

7. **Gloeosporium rufomaculans** (Berk.) Thüm. Fungi Pomicoli 59. 1879.

See *Glomerella rufomaculans*.

8. **Gloeosporium Vanillae** Cooke, Grevillea **15**: 18. 1886.

See *Glomerella rufomaculans*.

9. **Gloeosporium Violae** Berk. & Br. Ann. Mag. Nat. Hist. V. **1**: No. 1703 1878.

On *Viola* sp., Porto Rico:—Europe.

3. **MELANCONIUM** Link in Willd. Sp. Pl. $6^2$: 89. 1825.

1. **Melanconium Sacchari** Massee; Sacc. & Syd. in Sacc. Syll. Fung. **14**: 1019. 1899.

On dead and dying stalks and leaf sheaths of *Saccharum officinarum* L., Porto Rico:—continental South America.

2. **? Melanconium Saccharinum** Penz. & Sacc. Malpighia **15**: 238. 1902.

On *Bambos* [*Bambusa*] *vulgaris* Schrad., *Cymbopogon* sp., and *Saccharum officinarum* L., Porto Rico:—Java.

4. **PESTALOZZIA** De-Not. Mem. Accad. Torino III. **3**: 80. 1841.

1. **Pestalozzia Coccolobae** Ellis & Ev. Field Columb. Mus. Pub. Bot. Series **1**: 286. 1896.

On *Coccolobis uvifera* (L.) Jacq., Porto Rico:—Yucatan.

2. **Pestalozzia funerea** Desm. Ann. Sci. Nat. II. **19**: 335. 1843.

On *Euterpe globosa* Gaertn.[ *Acrista monticola* Cook], *Chrysobalanus Icaco* L., *Clusia rosea* Jacq., *Hippocratea volubilis* L., *Inga Inga* (L.) Britton, *Musa paradisiaca* L., *Pithecellobium Unguis-cati* (L.) *Mart.*, *Poinciana pulcherrima* L., Porto Rico:—continental North America; Europe.

3. **Pestalozzia Guepini** Desm. Ann. Sci. Nat. II. **13:** 182. 1840.

On *Citrus* sp., *Jambos Jambos* (L.) Millsp., *Mangifera indica* L., Porto Rico:—continental North America; Europe.

4. **Pestalozzia Lucumae** Tehon, Bot. Gaz. **67:** 508. 1919.

On *Lucuma multiflora* A. DC., Porto Rico:—endemic.

5. **Pestalozzia Palmarum** Cooke, Grevillea **4:** 115. 1876.

On *Acrocomia aculeata* (Jacq.) Lodd. [*Acrocomia media* Cook], *Areca Catechu* L., *Cocos nucifera* L., *Phoenix reclinata* Jacq., Porto Rico:—continental South America; Europe.

## Order 3. HYPHOMYCETALES.

Conidiophores distinct from each other.
- Hyphae hyaline or white; the conidiophores and conidia similar. — Fam. 1. MUCEDINACEAE.
- Hyphae dark colored or black, seldom light; conidia mostly dark. — Fam. 2. DEMATIACEAE.

Conidiophores united or fasciculate.
- Hyphae and conidiophores forming a coremium. — Fam. 3. STILBACEAE.
- Hyphae and conidiophores forming a cushion-like body. — Fam. 4. TUBERCULARIACEAE.

## Family 1. MUCEDINACEAE.

1. **ACREMONIUM** Link, Ges. Nat. Freunde Berlin Mag. **3:** 15. 1809.

**Acremonium Meliola** Stevens, Bot. Gaz. **65:** 234. 1918.

On *Meliola Paulliniae* Stevens on *Paullinia pinnata* L., Porto Rico:—endemic.

2. **ACROSTALAGMUS** Corda, Ic. Fung. **2:** 15. 1838.

**Acrostalagmus albus** Preuss, Linnaea **24:** 126. 1851.

On sucking insects on the following hosts:—*Capsicum annuum* L., *Cucumis sativus* L., *Osmia odorata* (L.) Sch. Bip. [*Eupatorium odoratum* L.], *Abelmoschus esculentus* (L.) Moench., *Palicourea* sp., *Solanum Melongena* L., *Saccharum officinarum* L., Porto Rico:—Europe.

3. **ARTHROBOTRYS** Corda, Pracht-Fl. 43. 1839.

**Arthrobotrys superba** Corda, Pracht-Fl. 43. 1839.

On dead and dying leaves and debris of *Saccharum officinarum* L., Porto Rico:—Europe.

4. **BLASTOTRICHUM** Corda, Ic. Fung. **2:** 10. 1838.

**Blastotrichum Miconiae** Stevens, Trans. Ill. Acad. Sci. **10:** 202. 1917.

On *Miconia laevigata* (L.) DC., Porto Rico:—endemic.

5. **BOTRYTIS** Link in Willd. Sp. Pl. **6**[1]: 53. 1824.

**Botrytis Rileyi** Farlow; Riley, Rep. U. S. Dept. Agr. **1883:** 121. 1884.

On *Laphygma frugiperda*, Porto Rico:—continental North America.

6. **CEPHALOSPORIUM** Corda, Ic. Fung. **3:** 11. 1839.

**Cephalosporium Lecanii** Zimm. Teijsmannia **9:** 9. 1899.

On *Aspidiotus destructor* on *Cocos nucifera* L., *Coccus mangifera* on *Mangifera indica* L., *Pseudococcus Nipae* on *Psidium Guajava* L. and *Erythrina glauca* Willd., Porto Rico:—Europe.

7. **CHROMOSPORIUM** Corda in Sturm, Deuts. Fl. Pilze **2:** 119. 1837.

**Chromosporium formicarum** Ferd. & Winge, Bot. Tidssk. **29:** 21. 1908.

On brittle trunk, St. Jan:— endemic.

**Chromosporium pachyderma** Ferd. & Winge, Bot. Tidssk. **29:** 22. 1908.

On wood, St. Croix:—endemic.

8. **DIDYMARIA** Corda, Ic. Fung. **5:** 9. 1842.

**Didymaria Solani** Seaver, Mycologia **16:** 9. 1924.

On living leaves of *Solanum* sp., St. Thomas:—endemic.

9. **DIPLOSPORIUM** Bonord. Handb. Allgem. Mykol. 98. 1851.

**Diplosporium album fungicola** Stevens, Trans. Ill. Acad. Sci. **10:** 202. 1917.

On *Dimerium Cayaponiae* Garman on *Cayaponia* sp., Porto Rico:—endemic.

10. **METARRHIZIUM** Sor. Pfl. Paras. Mensch. **2:** 168. 1883.

1. **Metarrhizium Anisopliae** (Metschn.) Sor. l. c.

*Entomophthora Anisopliae* Metschn. Zeit. Kaiserl. Landw. Ges. Neur. **1879:** 21–50.

On various insect hosts, Porto Rico:—Europe.

11. **MONILIA** Weber; Wigg. Fl. Holsat. 111. 1780.

1. **Monilia Ashfordii** (See *Parasaccharomyces*).

2. **Monilia sitophila** (Mont.) Sacc. Michelia **2:** 359. 1881.

*Penicillium sitophilum* Mont. Ann. Sci. Nat. II. **20:** 377. 1843.

On dead debris of *Saccharum officinarum* L., after burning in all parts of Porto Rico:—Europe.

12. **MONOGRAMMIA** Stevens, Trans. Ill. Acad. Sci. **10:** 202. 1917.

1. **Monogrammia Miconiae** Stevens, Trans. Ill. Acad. Sci. **10:** 202. 1917.

On *Miconia* sp., Porto Rico:—endemic.

13. **MONOSPORIUM** Bonord. Handb. Allgem. Mykol. 95. 1851.

1. **Monosporium uredinicolum** Stevens, Trans. Ill. Acad. Sci. **10:** 201. 1917.

On *Coleosporium Ipomoeae* (Schw.) Burr. on *Ipomoea Batatas* (L.) Lam., Porto Rico:—endemic.

14. **OIDIUM** Link, Ges. Nat. Freunde Berlin Mag. **3:** 18. 1809.

1. **Oidium Cyparissiae** Syd. Hedwigia **36:** (163). 1897.

On *Chamaesyce hirta* (L.) Millsp. [*Euphorbia pilulifera* L.], St. Croix; *Chamaesyce* sp., St. Thomas:—Europe.

2. **Oidium Lactis** Fres. Beitr. Myk. 23. 1850.

Causing acetic fermentation of fruit juices, Porto Rico:—Europe.

3. **Oidium** sp.,

On many host plants, *Cassia* sp., *Cosmos* sp., *Crotalaria retusa* L., *Phaseolus lathyroides* L., *Priva lappulacea* (L.) Pers., St. Croix:—widely distributed.

15. **PELLICULARIA** Cooke, Grevillea **4**: 116. 1876.

1. **Pellicularia koleroga** Cook, Grevillea **4**: 116. 1876.

See *Corticium koleroga* (Cooke) Höhn.

16. **PHYSOSPORA** Fries, Fl. Scanica 360. 1835. (hyponym); Summa Veg. Scand. 495. 1849.

1. **Physospora rubiginosa** Fries, Summa Veg. Scand. 495. 1849.

On bark, St. Jan:—Europe; continental America; Africa.

17. **PIRICULARIA** Sacc. Michelia **2**: 20. 1880.

1. **Piricularia grisea** (Cooke) Sacc. Michelia **2**: 148. 1880.

*Trichothecium griseum* Cooke in Rav. Fungi Am. *580.* 1881.

*On Oryza sativa* L., *Syntherisma digitata* (Sw.) Hitchc., Porto Rico:—continental North America.

2. **Piricularia Oryzae** Cav. Fung. Long. Exsicc. *49.* 1891.

On leaves of *Oryza sativa* L., Porto Rico:—Europe.
Possibly identical with the preceding.

18. **RAMULARIA** Ung. Exantheme Pfl. 169. 1833.

1. **Ramularia areola** Atk. Bot. Gaz. **15**: 168. 1890.

On *Gossypium barbadense* L., Porto Rico:—continental North America.

2. **Ramularia Coleosporii** Sacc. Michelia **2**: 170. 1880.

*On Coleosporium Ipomoeae* (Schw.) Burr. on *Ipomoea Batatas* (L.) Lam., Porto Rico:—Europe.

3. **Ramularia cylindrosporioides** Stevens; Stevenson, Jour. Dept. Agr. Porto Rico **2**: 209. 1918.

See *Septoriopsis Piperis* Stevens.

4. **Ramularia Mimosae** Stevens & Dalbey, Mycologia **11**: 6. 1919.

On *Mimosa pudica* L., Porto Rico:—endemic.

19. **SPICARIA** Harting, emend. Harz, Bull. Soc. Imp. Mosc. **44**: 137. 1871.

1. **Spicaria colorans** De Jonge, Rec. Trav. Bot. Neerl. **6**: 48. 1909.

On *Theobroma Cacao* L., Porto Rico:—continental South America.

20. **SPOROTRICHUM** Link in Willd. Sp. Pl. 6[1]: 1. 1824.

1. **Sporotrichum globulifer** Speg. Anal. Soc. Ci. Argent. **10**: 42. 1880.

On insects, thrips, leaf hoppers, etc., Porto Rico:—continental South America.

21. **STEPHANOMA** Wallr. Fl. Crypt. **2**: 269. 1833.

1. **Stephanoma Meliolae** Stevens & Dalbey, Mycologia **11**: 9. 1919.

On *Meliola tortuosa* Winter, on *Pothomorphe peltata* (L.) Miq., Porto Rico:—endemic.

22. **TRICHODERMA** Pers. Disp. Fung. 12. 1797.

1. **Trichoderma lignorum** (Tode) Harz, Bull. Soc. Imp. Mosc. **44**: 116. 1871.

*Pyrenium lignorum* Tode, Fungi Meckl. **1**: 33. 1790.

On dead and dying leaves and stalks of *Saccharum officinarum* L., Porto Rico; St. Jan; St. Croix:—continental North America; Europe.

23. **TRICHOTHECIUM** Link in Willd. Sp. Pl. 6[1]: 28. 1824.

1. **Trichothecium fusarioides** Stevens, Trans. Ill. Acad. Sci. **10**: 201. 1917.

On *Phyllachora peribebuyensis* Speg. on *Miconia* sp., Porto Rico:—endemic.

24. **VERTICILLIUM** Link in Willd. Sp. Pl. 6[1]: 75. 1824.

1. **Verticillium heterocladum** Penz. Michelia **2**: 462. 1882.

On unidentified insects on *Ocotea leucoxylon* (Sw.) Mez. and *Nectandra* sp., Porto Rico:—Europe.

Family 2. **DEMATIACEAE.**

1. **ACROTHECIUM** Corda in Sturm, Deuts. Fl. Pilze **6**: 85. 1862.

1. **Acrothecium flacatum** Tehon, Bot. Gaz. **67**: 509. 1919.

On species of *Setaria*, Porto Rico:—endemic.

2. **ALTERNARIA** Nees, Syst. Pilze 41. 1837.

1. **Alternaria Dianthi** Stevens & Hall, Bot. Gaz. **47**: 409. 1909; Rep. Div.Biol. N. Car. Exp. Sta. **33**: 75. 1909.

On *Dianthus* sp., Porto Rico:—endemic.

2. **Alternaria Citri** Pierce, Bot. Gaz. **33**: 234. 1902.

On *Citrus sinensis* Osbeck (fruit), Porto Rico:—continental North America.

3. **Alternaria Solani** (Ellis & Martin) Jones & Grout, Jour. Agr. Vict. **2**: 464. 1904.

*Macrosporium Solani* Ellis & Martin, Am. Nat. **16**: 1003. 1882.

On *Brugmansia suaveolens* (H. & B.) Bercht. & Presl. [*Datura suaveolens* H. & B.?], *Solanum tuberosum* L., Porto Rico:—continental North America.

3. **ARTHRINIUM** Kunze, Myk. Hefte **1**: 9. 1817.

1. **Arthrinium saccharicola** Stevenson, Jour. Dept. Agr. Porto Rico **1**: 223. 1917.

On dead leaves of *Saccharum officinarum* L., Porto Rico:—endemic.

4. **BASISPORIUM** Moll. Bull. Soc. Myc. Fr. **18:** 167. 1902.

1. **Basisporium gallarum** Moll. Bull. Soc. Myc. Fr. **18:** 170. 1902.

On dead stalks and leaves of *Saccharum officinarum* L., and other grasses, Porto Rico:—Europe.

5. **BRACHYSPORIUM** Sacc. Michelia **2:** 28. 1880.

1. **Brachysporium stemphylioides** (Corda) Sacc. Syll. Fung. **4:** 424. 1886.
*Helminthosporium stemphylioides* Corda, Pracht-Fl. 7. 1839.
On *Annona montana* Macf., Porto Rico:—Europe.

6. **CERCOSPORA** Fres.; Fuckel, Fungi Rhen. *118.* 1863.

1. **Cercospora Achyranthis** Sydow, Ann. Myc. **7:** 171. 1909.

On *Centrostachys aspera* (L.) Standley [*Achyranthes aspera* L.], Porto Rico:—Japan.

2. **Cercospora Acrocomiae** Stevenson, Ann. Rep. Ins. Exp. Sta. **17:** 89. 1916.

On *Acrocomia aculeata* (Jacq.) Lodd., Porto Rico:—endemic.

3. **Cercospora Alternantherae** Ellis & Langlois, Jour. Myc. **6:** 36. 1890.

On *Achyranthes* [*Alternanthera*] *portoricensis* (Kuntze) Standley, Porto Rico:—continental North America.

4. **Cercospora Amaryllidis** Ellis. & Ev. Jour. Myc. **3:** 14. 1887.

On *Hymenocallis declinata* (Jacq.) M. Roem., Porto Rico:—continental North America.

5. **Cercospora atricincta** Heald & Wolf, Mycologia **3:** 14. 1911.

On *Crassina elegans* (Jacq.) Kuntze, Porto Rico:—continental North America.

6. **Cercospora Bernardiae** Stevens, Trans. Ill. Acad. Sci. **10:** 213. 1917.

On *Adelia Bernardia* L. [*Bernardia Bernardia* (L.) Millsp.], Porto Rico:—endemic.

7. **Cercospora beticola** Sacc. Nuov. Giorn. Bot. Ital. **8:** 189. 1876.

On *Beta vulgaris* L., Porto Rico:—continental North America.

8. **Cercospora biformis** Peck, Bull. Torrey Club **36:** 156. 1909.

On *Passiflora sexflora* Juss., Porto Rico:—continental North America.

9. **Cercospora Bixae** Allesch. & Noack, Bol. Inst. Agr. Estado **9:** 95. 1898.

On *Bixa Orellana* L., Porto Rico:—continental South America.

10. **Cercospora Bloxami** Berk. & Br. Ann. Mag. Nat. Hist. V. **9:** 183. 1882.

On species of *Brassica*, Porto Rico:—Europe.

11. **Cercospora borinquensis** Young, Mycologia **8:** 45. 1916.

On *Calopogonium orthocarpum* Urban, Porto Rico:—endemic.

12. **Cercospora Bradburyae** Young, Mycologia **8**: 46. 1916.

On *Bradburya pubescens* (Benth.) Kuntze, Porto Rico:—endemic.

13. **Cercospora Cajani** P. Henn. Hedwigia **41**: 309. 1902.

On *Cajan Cajan* (L.) Millsp., Porto Rico:—continental South America. This has been transferred to *Colletotrichum* by later authors.

14. **Cercospora canescens** Ellis & Martin, Am. Nat. **16**: 1003. 1882.

On *Dolichos Lablab* L., *Phaseolus lunatus* L., *P. vulgaris* L., *Vigna unguiculata* (L.) Walp., Porto Rico:—continental North America.

15. **Cercospora Capsici** Heald & Wolf, Mycologia **3**: 15. 1911.

On *Capsicum annuum* L., Porto Rico:—continental North America.

16. **Cercospora carbonacea** Miles, Trans. Ill. Acad. Sci. **10**: 255. 1917.

On *Dioscorea alata* L., Porto Rico:—endemic.

17. **Cercospora Caricae** Speg. Anal. Soc. Ci. Argent. **22**: 215. 1886.

See *Pucciniopsis Caricae*.

18. **Cercospora Caseariae** Stevens, Trans. Ill. Acad. Sci. **10**: 212. 1917.

On species of *Casearia*, Porto Rico:—endemic.

19. **Cercospora Cassavae** Ellis & Ev. Bull. Torrey Club **22**: 438. 1895.

On *Manihot Manihot* (L.) Cockerell, Porto Rico:—continental North America.

Thought to be the same as *C. Henningsii* Allesch.

20. **Cercospora Chamaecristae** Ellis & Kellerm. Jour. Myc. **4**: 7. 1888.

On *Herpetica alata* Raf. [*Cassia alata* L.], *Ditremexa occidentalis* (L.) Britton & Rose [*Cassia occidentalis* L.], Porto Rico:—continental North America.

21. **Cercospora citrullina** Cooke in Rav. Fungi Am. *589;* Grevillea **12**: 31. 1883.

On *Citrullus Citrullus* (L.) Karst. [*Citrullus vulgaris* Schrad.], Porto Rico:—continental North America.

22. **Cercospora coffeicola** Berk. & Curt.; Ellis & Ev. Jour. Myc. **4**: 5. 1888.

On *Coffea arabica* L., Porto Rico:—Jamaica; Guatemala.

23. **Cercospora conspicua** Earle, Bull. N. Y. Bot. Garden **3**: 312. 1905.

On *Cleome spinosa* Jacq., Porto Rico:—endemic.

24. **Cercospora cruenta** Sacc. Michelia **2**: 149. 1880.

On *Phaseolus lunatus* L., *Vigna unguiculata* (L.) Walp., Porto Rico:—continental North America.

25. **Cercospora Cucurbitae** Ellis & Ev. Jour. Myc. **4**: 3. 1888.

On *Cucurbita Lagenaria* L.,Porto Rico:—continental North America.

26. **Cercospora cucurbiticola** P. Henn. Hedwigia **43**: 95. 1904.

On *Cayaponia* sp., Porto Rico:—continental South America.

27. **Cercospora densissima** Speg. Anal. Mus. Nac. Buenos Aires **6**: 341. 1899.

On *Sida* sp., Mona Island:—continental South America.

28. **Cercospora flagellaria** Ellis & Martin, Am. Nat. **16**: 1003. 1882.

On *Phytolacca icosandra* L., Porto Rico:—continental North America.

29. **Cercospora Gilbertii** Speg. Anal. Soc. Ci. Argent. **10**: 38. 1880.

On *Iresine Celosia* L. [*Iresine paniculata* (L.) Kuntze], Porto Rico:—continental South America.

30. **Cercospora gossypina** Cooke, Rav. Fungi Am. *585;* Grevillea **12**: 31. 1883.

On *Gossypium barbadense* L., Porto Rico:—continental North America.

31. **Cercospora guanicensis** Young, Mycologia **8**: 45. 1916.

On *Guilandina Crista* (L.) Small [*Caesalpinia Crista* L.], Porto Rico:—endemic.

32. **Cercospora Henningsii** Allesch.; P. Henn. in Engl. Ostafr. Pflanz. **3**: 35. 1895.

On *Manihot Manihot* (L.) Cockerell, Porto Rico:—East Africa.

33. **Cercospora Hibisci** Tracy & Earle, Bull. Torrey Club **22**: 179. 1895.

On *Abelmoschus esculentus* (L.) Moench. [*Hibiscus esculentus* L.], *Pariti tiliaceum* (L.) St. Hil., Porto Rico:—continental North America.

34. **Cercospora Hurae** Stevens, Trans. Ill. Acad. Sci. **10**: 210. 1917.

On *Hura crepitans* L., Porto Rico:—endemic.

35. **Cercospora Hydropiperis** (Thüm.) Speg. Anal. Soc. Ci. Argent. **9**: 191. 1880.

On *Persicaria punctata* (Ellis) Small, Porto Rico:—continental South America.

36. **Cercospora Lepidii** Peck, Ann. Rep. N. Y. State Mus. **35**: 140. 1884.

On *Lepidium virginicum* L., Porto Rico; Mona Island:—continental North America.

37. **Cercospora longipes** Butler, Mem. Dept. Agr. India $1^3$: 44. 1906.

On *Saccharum officinarum* L., Porto Rico:—India.

38. **Cercospora longissima** (Cug.) Sacc. Syll. Fung. **18**: 607. 1906.

*Cercospora longispora* Cug.; Traverso, Malpighia **17**: 217. 1903.
*Cercospora Lactucae* Stevenson, Jour. Dept. Agr. Porto Rico **1**: 105. 1917.
*Cercospora Lactucae* Welles, Phytopathology **13**: 289. 1923. Not *Cercospora Lactucae* P. Henn. Bot. Jahr. **31**: 742. 1902.

On *Lactuca sativa* L., Porto Rico:—Italy; Philippine Islands.

39. **Cercospora Malachrae** Heald & Wolf, Mycologia **3**: 19. 1911.
*Cercospora Malachrae* Young, Mycologia **8**: 45. 1916.
On *Malachra alceifolia* Jacq. [*Malachra rotundifolia* Schrank], Porto Rico:—continental North America.

40. **Cercospora maricaoensis** Young, Mycologia **8**: 44. 1916.
On *Teramnus uncinatus* (L.) Sw., Porto Rico:—endemic.

41. **Cercospora mikaniaecola** Stevens, Trans. Ill. Acad. Sci. **10**: 213. 1917.
On *Mikania* sp., Porto Rico:—endemic.

42. **Cercospora Mucunae** Sydow, Hedwigia **42**: (106). 1903.
On *Stizolobium pruritum* (Wight) Piper, *Mucuna urens* (L.) DC., Porto Rico:—continental North America.

43. **Cercospora Nicotianae** Ellis & Ev. Proc. Acad. Sci. Phila. **1893**: 170. 1893.
On *Nicotiana Tabacum* L., Porto Rico:—continental North America.

44. **Cercospora Oryzae** Miy. Jour. Coll. Agr. Tokyo **2**: 263. 1910.
On *Oryza sativa* L., Porto Rico:—Japan.

45. **Cercospora Pancratii** Ellis & Ev. Jour. Myc. **3**: 15. 1887.
On *Crinum* sp., St. Thomas:—continental North America.

46. **Cercospora personata** (Berk. & Curt.) Ellis, Jour. Myc. **1**: 63. 1885.
*Cladosporium personatum* Berk. & Curt. Grevillea **3**: 106. 1874.
On *Arachis hypogaea* L., Porto Rico:—continental North America.

47. **Cercospora Pisa-sativae** Stevenson, Ann. Rep. Ins. Exp. Sta. **1917–1918**: 138. 1919.
On *Pisum sativum* L., Porto Rico:—endemic.

48. **Cercospora Phyllitidis** Hume, Bull. Torrey Club **27**: 577. 1900.
On *Polypodium* sp., Porto Rico:—continental North America.

49. **Cercospora portoricensis** Earle, Muhlenbergia **1**: 15. 1901.
On *Piper aduncum* L., *P. scabrum* Sw., *Pothomorphe peltata* (L.) Miq. [*Piper peltatum* L., *P. umbellatum* L.], Porto Rico:—endemic.

50. **Cercospora ricinella** Sacc. & Berl. Atti Ist. Ven. VI. **3**: 11. 1885.
On *Ricinus communis* L., Porto Rico:—continental North America; Australia.

51. **Cercospora rigospora** Atk. Jour. Elisha Mitchell Soc. **8**: 65. 1891.
On *Solanum nigrum* L., Porto Rico:—continental North America.

52. **Cercospora rosicola** Pass. Myc. Univ. *333;* Bot. Jahresb. **1875**: 276.
On species of *Rosa*, Porto Rico:—continental North America; Europe.

53. **Cercospora Sagittariae** Ellis & Kellerm. Jour. Myc. **2:** 1. 1886.
On *Sagittaria lancifolia* L., Porto Rico:—continental North America.

54. **Cercospora Sechiae** Stevenson, Jour. Dept. Agr. Porto Rico **2:** 214. 1918.
On *Sechium edule* (Jacq.) Sw., Porto Rico:—endemic.

55. **Cercospora Sesami** Zimm. Ber. Forstw. Deutsch-Ostafr. **1904:** 28.
On *Sesamum orientale* L., Porto Rico:—East Africa.

56. **Cercospora simulata** Ellis & Ev. Jour. Myc. **1:** 64. 1885.
*Cercospora Chamaecristae* Ellis & Kellerm., may be the same.
On *Herpetica alata* Raf., Porto Rico:—continental North America.

57. **Cercospora Stevensii** Young, Mycologia **8:** 45. 1916.
On *Andira inermis* H. B. K., Porto Rico:—endemic.

58. **Cercospora Thouiniae** Stevens, Trans. Ill. Acad. Sci. **10:** 213. 1917.
On *Thyana striata* (Radlk.) Britton [*Thouinia striata* Radlk.], Porto Rico:—endemic.

59. **Cercospora Tiglii** P. Henn. Hedwigia **47:** 265. 1908.
On *Croton lobatus* L., Vieques:—continental South America.

60. **Cercospora trichophila** Stevens, Trans. Ill. Acad. Sci. **10:** 212. 1917.
On *Helicteres jamaicensis* Jacq., *Solanum torvum* Sw., *S. verbascifolium* L., Porto Rico:—endemic.

61. **Cercospora Trichostigmae** Stevens, Trans. Ill. Acad. Sci. **10:** 211. 1917.
On *Trichostigma octandrum* (L.) H. Walt., Porto Rico:—endemic.

62. **Cercospora Vaginae** Kruger; Walker & Went, Meded. Suik. Proefst. West-Java **24:** 8. 1896.
On *Saccharum officinarum* L., Porto Rico:—Java.

63. **Cercospora venturioides** Peck, Ann. Rep. N. Y. State Mus. **34:** 47. 1881.
On *Asclepias curassavica* L., Porto Rico:—continental America.

64. **Cercospora Vignae** Racib. Zeit. Pflanzenkrank. **8:** 66. 1898.
On *Vigna unguiculata* (L.) Walp., Porto Rico:—Java.

65. **Cercospora Violae** Sacc. Nuov. Giorn. Bot. Ital. **8:** 187. 1876.
On *Viola* sp., Porto Rico:—continental North America; Europe.

7. **CERCOSPORIDIUM** Earle, Muhlenbergia **1:** 16. 1901.

1. **Cercosporidium Helleri** Earle, Muhlenbergia **1:** 16. 1901.
On *Sphenoclea zeylanica* Gaertn., Porto Rico:—endemic.

Doubtful Species.

1. Cercosporium beticola.

Reported by Stevenson but perhaps meant for *Cercospora beticola*. Causing root-rot of beans.

2. Cercosporium urticola.

Reported by Cook in Diseases of Tropical Plants but may be same as above.

8. **CLADOSPORIUM** Link in Willd. Sp. Pl. **6**[1]: 39. 1824.

1. **Cladosporium Calotropidis** Stevens, Trans. Ill. Acad. Sci. **10**: 207. 1917.

On *Calotropis procera* (Ait.) R. Br., Porto Rico:—endemic.

2. **Cladosporium Citri** Massee, Text Book Pl. Dis. 310. 1899.

On species of *Citrus*, Porto Rico:—continental North America.

3. **Cladosporium fulvum** Cooke, Grevillea **12**: 32. 1883.

On *Lycopersicon Lycopersicon* (L.) Karst., *Solanum torvum* Sw., Porto Rico:—continental North America.

4. **Cladosporium guanicensis** Stevens, Trans. Ill. Acad. Sci. **10**: 207. 1917.

On *Argemone mexicana* L., Porto Rico:—endemic.

5. **Cladosporium herbarum** (Pers.) Link, Ges. Nat. Freunde Berlin Mag. **7**: 37. 1815.

*Dematium herbarum* Pers. Ann. Bot. Usteri **11**: 32. 1794.

On various plants usually on the dead or dying tissues: *Bauhinia* sp., *Canna coccinea* Mill., *C. glauca* L., *Canavali maritima* (Aubl.) Thou. [*Canavalia obtusifolia* P. DC.], *Agati grandiflora* (L.) Desv. [*Sesbania grandiflora* Pers.], *Solanum Melongena* L., Porto Rico:—probably world-wide in distribution.

6. **Cladosporium hypophloeum** Berk. & Curt. Jour. Linn. Soc. **10**: 362. 1868.

On *Thyana* [*Thouinia*] sp., Porto Rico:—Cuba.

7. **Cladosporium Mansoni** (Cast.) Pinoy; Cast. & Chalmers, Manual of Trop. Med. Ed. 2. 837. 1913.

*Microsporon Mansoni* Castellani——1905.

Occurring as the cause of a human skin disease, black ringworm, Porto Rico:—tropical lands.

8. **Cladosporium Mikaniae** Stevens, Trans. Ill. Acad. Sci. **10**: 208. 1917.

On *Mikania* sp., Porto Rico:—endemic.

9. **ELLISIELLA** Sacc. Michelia **2**: 26. 1880.

1. **Ellisiella portoricensis** Stevens, Trans. Ill. Acad. Sci. **10**: 203. 1917.

On *Clusia rosea* Jacq., Porto Rico:—endemic.

10. **FUMAGO** Pers. Myc. Eu. **1**: 9. 1822.

1. **Fumago vagans** Pers. Myc. Eu. **1**: 9. 1822.

On leaves of *Piper Amalago* L., and *Mangifera indica* L., St. Thomas:—widely distributed.

11. **HAPLOGRAPHIUM** Berk. & Br. Ann. Mag. Nat. Hist. III. **3**: 360. 1859.

1. **Haplographium echinatum** (Riv.) Sacc. Syll. Fung. **4**: 307. 1886.
*Penicillium echinatum* Riv. Parass. 45. 1873.
Isolated from soil, Porto Rico:—Europe.

2. **Haplographium portoricense** Stevens & Dalbey, Mycologia **11**: 6. 1919.
On *Canna coccinea* Mill., Porto Rico:—endemic.

12. **HELMINTHOSPORIUM** Link, Ges. Nat. Freunde Berlin Mag. **3**: 10. 1809.

1. **Helminthosporium Caladii** Stevens, Trans. Ill. Acad. Sci. **10**: 209. 1917.
On *Cyrtospadix bicolor* (Ait.) Britton & P. Wilson [*Caladium bicolor* Vent.], Porto Rico:—endemic.

2. **Helminthosporium folliculatum brevipilum** Corda, Ic. Fung. **2**: 13. 1838.
On *Paspalum conjugatum* Berg., Porto Rico:—Europe.

3. **Helminthosporium glabroides** Stevens, Bot. Gaz. **65**: 240. 1918.
On species of *Meliola* on numerous hosts, Porto Rico:—endemic.

4. **Helminthosporium Gossypii** Tucker, Jour. Agr. Res. **32**: 394. 1926.
Causing a leaf spot on Sea Island Cotton, Porto Rico:—endemic.

5. **Helminthosporium guareicolum** Stevens, Bot. Gaz. **65**: 241. 1918.
On *Meliola guareicola* Stevens, Porto Rico:—endemic.

6. **Helminthosporium Helleri** Stevens, Bot. Gaz. **65**: 242. 1918.
On species of *Meliola* on various hosts, Porto Rico:—endemic.

7. **Helminthosporium mayaguezense** Miles, Trans. Ill. Acad. Sci. **10**: 253. 1917.
On *Paspalum conjugatum* Berg., Porto Rico:—endemic.

8. **Helminthosporium melastomacearum** Stevens, Bot. Gaz. **65**: 242. 1918.
On species of *Meliola* on various hosts, Porto Rico:—endemic.

9. **Helminthosporium Ocoteae** Stevens, Bot. Gaz. **65**: 241. 1918.
On *Meliola Ocoteae* Stevens on *Ocotea leucoxylon* (Sw.) Mez., Porto Rico:—endemic.

10. **Helminthosporium Oryzae** Breda de Haan, Bull. Inst. Bot. Buitenz. **6**: 11. 1900.
On *Oryza sativa* L., Porto Rico:—Java.

11. **Helminthosporium Panici** Stevens, Bot. Gaz. **65**: 242. 1918.
On *Meliola Panici* Earle and other species of *Meliola* on various hosts, Porto Rico:—endemic.

12. **Helminthosporium parathesicolum** Stevens, Bot. Gaz. **65**: 242. 1918.

On species of *Meliola* on *Parathesis* and other hosts, Porto Rico:—endemic.

13. **Helminthosporium Philodendri** Stevens, Bot. Gaz. **65**: 242. 1918.

On *Meliola Helleri* Earle on various hosts, Porto Rico:—endemic.

14. **Helminthosporium Ravenelii** Curt.; Berk. Grevillea **3**: 102. 1874.

On *Sporobolus indicus* (L.) R. Br., Porto Rico:—Cuba; Bermuda; continental North America.

15. **Helminthosporium Sacchari** Butler, Mem. Dept. Agr. India, Bot. Series **6**: 204. 1913.

On *Saccharum officinarum* L., Porto Rico:—India.

*Cercospora Sacchari* Br. de Haan is thought by Butler to be a *Helminthosporium* and may be identical with the above. This fungus is the cause of a disease known as "eye-spot."

16. **Helminthosporium sechicola** Stevenson, Jour. Dept. Agr. Porto Rico **2**: 216. 1918.

On *Sechium edule* (Jacq.) Sw., Porto Rico:—endemic.

17. **Helminthosporium spiculiferum** Ellis & Ev. Jour. Myc. **2**: 104. 1886.

On *Thrinax* sp., Porto Rico:—continental North America.

18. **Helminthosporium Stahlii** Stevens, Trans. Ill. Acad. Sci. **10**: 208. 1917.

On *Passiflora foetida* L., Porto Rico:—endemic.

19. **Helminthosporium Turcicum** Pass. Boll. Comz. Agr. Parmense **10**: 2. 1876.

On *Zea Mays* L., Porto Rico:—Europe.

20. **Helminthosporium Varroniae** Stevens, Trans. Ill. Acad. Sci. **10**: 209. 1917.

On *Varronia* sp., Porto Rico:—endemic.

13. **HETEROSPORIUM** Klotsch; Cooke, Grevillea **5**: 122. 1877.

1. **Heterosporium repandum** Ferd. & Winge, Bot. Tidssk. **29**: 23. 1908.

On dry branches, St. Thomas:—endemic.

14. **HORMIACTELLA** Sacc. Syll. Fung. **4**: 311. 1886.

1. **Hormiactella Sacchari** Johnston, Jour. Dept. Agr. Porto Rico **1**: 224. 1917.

On dead leaves of *Saccharum officinarum* L., and other grasses, Porto Rico:—endemic.

15. **ISTHMOSPORA** Stevens, Bot. Gaz. **65**: 244. 1918.

1. **Isthmospora glabra** Stevens, Bot. Gaz. **65**: 244. 1918.

On species of *Meliola*, Porto Rico:—endemic.

2. **Isthmospora spinosa** Stevens, Bot. Gaz. **65**: 244. 1918.
On species of *Meliola* on various hosts, Porto Rico:—endemic.

16. **MACROSPORIUM** Fries, Syst. Myc. **3**: 373. 1829.

1. **Macrosporium Carotae** Ellis & Langlois, Jour. Myc. **6**: 36. 1890.
On cultivated carrots, Porto Rico:—continental America.

2. **Macrosporium parasiticum** Thüm. Myc. Univ. *667*. 1877.
On *Allium Cepa* L., Porto Rico:—Bermuda; continental America.

3. **Macrosporium Porri** Ellis, Grevillea **8**: 12. 1879.
On *Allium Cepa* L., Porto Rico:—continental North America.

17. **MICROCLAVA** Stevens, Trans. Ill. Acad. Sci. **10**: 204. 1917.

1. **Microclava Coccolobae** Stevens, Trans. Ill. Acad. Sci. **10**: 206. 1917.
On *Coccolobis diversifolia* Jacq., Porto Rico:—endemic.

2. **Microclava Miconiae** Stevens, Trans. Ill. Acad. Sci. **10**: 206. 1917.
On *Miconia laevigata* (L.) DC., Porto Rico:—endemic.

18. **NAPICLADIUM** Thüm. Hedwigia **14**: 3. 1875.

1. **Napicladium Fumago** Speg. Rev. Agr. Univ. La Plata II. **6**: 190. 1910.
On *Miconia* sp., Porto Rico:—continental North America.

2. **Napicladium portoricense** Speg. Bol. Acad. Ci. Cordoba **26**: 363. 1923.
On mycelium of Perisporiaceae on many hosts, Porto Rico:—endemic.

19. **PASSALORA** Fries, Summa Veg. Scand. 500. 1849.

1. **Passalora Cecropiae** Stevens, Trans. Ill. Acad. Sci. **10**: 207. 1917.
On *Cecropia peltata* L., Porto Rico:—endemic.

20. **PERICONIA** Tode, Fungi Meckl. **2**: 2. 1791.

1. **Periconia atra** Corda, Ic. Fung. **1**: 19. 1837.
On *Saccharum officinarum* L., St. Croix:—Europe.

2. **Periconia pycnospora** Fres. Beitr. Myk. 20. 1850.
On *Xanthosoma* sp., Porto Rico:—Europe.

3. **Periconia Sacchari** Johnston, Jour. Dept. Agr. Porto Rico **1**: 225. 1917.
On dead and dying leaves and stalks of *Saccharum officinarum* L., Porto Rico:—endemic.

21. **SEPTOIDIUM** Arnaud, Ann. Ephiphyties **7**: 106. 1921.

1. **Septoidium Stevensii** Arnaud, Ann. Ephiphyties **93**: 35. 1923.
On *Inga laurina* (Sw.) Willd., Porto Rico:—endemic.

22. **SEPTONEMA** Corda, Ic. Fung. **1**: 9. 1837.

1. **Septonema Sacchari** Johnst. & Stevenson, Jour. Dept. Agr. Porto Rico **1**: 225. 1917.

On dead leaves and stalks of *Saccharum officinarum* L., Porto Rico:—endemic.

23. **TETRACOCCOSPORIUM** Szabó, Hedwigia **44**: 77. 1905.

1. **Tetracoccosporium Sacchari** Stevenson, Jour. Dept. Agr. Porto Rico **1**: 225. 1917.

On sugar cane debris, Porto Rico:—endemic.

24. **TETRAPLOA** Berk. & Br. Ann. Mag. Nat. Hist. II. **5**: 459. 1850.

1. **Tetraploa aristata** Berk. & Br. Ann. Mag. Nat. Hist. II. **5**: 459. 1850.

On dead stalks and leaves of *Saccharum officinarum* L., Porto Rico:—Cuba; Europe.

25. **THIELAVIOPSIS** Went., Med. Proefst. West-Java 5:—1893.

1. **Thielaviopsis paradoxa** (De Seynes) Höhn. Hedwigia **43**: 295. 1904.

*Chalara paradoxa* De Seynes, Roch. Veg. Inf. **3**: 30. 1886.

On *Ananas Ananas* (L.) Cockerell [*Ananas sativus* Schult. (fruit)], *Cocos nucifera* L., *Saccharum officinarum* L., Porto Rico:—Europe.
Common in Porto Rico and causing much damage.

26. **TRIPSOSPORIUM** Corda, Ic. Fung. **1**: 16. 1837.

1. **Tripsosporium stelligerum** Speg. Rev. Agr. Univ. La Plata **6**: 196. 910.

On *Annona montana* Macf., *Chiococca alba* (L.) Hitchc., *Myrcia deflexa* (Poir) DC., *Canella Winterana* (L.) Gaertn., *Zamia latifoliata* Pren. Erroneously reported as *Z. integrifolia* Ait., Porto Rico:—continental South America.

27. **VERTICICLADIUM** Preuss, Linnaea **24**: 127. 1851.

1. **Verticicladium graminicolum** Johnst. & Stevenson, Jour. Dept. Agr. Porto Rico **1**: 226. 1917.

On dead leaves of *Saccharum officinarum* L., Porto Rico:—endemic.

28. **ZYGOSPORIUM** Mont. Pl. Cell. Cuba 303. 1838.

1. **Zygosporium oschiodes** Mont. Pl. Cell. Cuba 303. (1838?).

On *Carica Papaya* L., Porto Rico:—Cuba; Ceylon; Island of Tahiti.

Family 3. **STILBACEAE.**

1. **ARTHROBOTRYUM** Ces.; Berk. & Br. Ann. Mag. Nat. Hist. III. **3**: 361. 1859.

1. **Arthrobotryum caudatum** Sydow, Ann. Mus. Congo **3**: 22. 1909.

On *Meliola* on various hosts, Porto Rico:—South Africa.

2. **Arthrobotryum Dieffenbachiae** Stevens, Bot. Gaz. **65**: 237. 1918.

On *Meliola Dieffenbachiae* Stevens on *Dieffenbachia seguine* (Jacq.) Schott, Porto Rico:—endemic.

3. **Arthrobotryum glabroides** Stevens, Bot. Gaz. **65**: 237. 1918.

On *Meliola glabroides* Stevens on *Nectandra patens* (Sw.) Griseb., Porto Rico: —endemic.

4. **Arthrobotryum penicillatum** (Lév.) comb. nov.

*Meliola ? penicillata* Lév. Ann. Sci. Nat. III. **5**: 266. 1846.
*Podosporium penicillium* Speg. Bol. Acad. Ci. Cordoba **11**: 638. 1889.
*Arthrobotryum penicillium* Stevens, Bot. Gaz. **65**: 238. 1918.

On *Meliola Panici* Earle on various grasses, Porto Rico:—continental South America.

2. **DENDROGRAPHIUM** Massee, Grevillea **21**: 5. 1892.

1. **Dendrographium atrum** Massee, Grevillea **21**: 5. 1892.

On dead wood, Porto Rico:—continental South America.

3. **GIBELLULA** Cavara, Atti Ist. Bot. Univ. Pavia **3**: 347. 1894.

1. **Gibellula arachnophila** Johnston, Comm. Agr. Ins. Exp. Sta. Porto Rico, Bull. **10**: 24. 1915.

On spiders of family Attidae, Porto Rico:—endemic.

4. **HIRSUTELLA** Pat. Rev. Myc. **14**: 69. 1892.

1. **Hirsutella citriformis** Speare, Mycologia **12**: 70. 1920.

Reported on Fulgoridae, Porto Rico:—New Zealand; Hawaii.

5. **GRAPHIUM** Corda, Ic. Fung. **1**: 18. 1837.

1. **Graphium Sacchari** Speg. Rev. Agr. Univ. La Plata **1896**: 253.

On dead stalks of *Saccharum officinarum* L., Porto Rico:—continental South America.

2. **Graphium squarrosum** Ellis & Langl. Jour. Myc. **6**: 36. 1890.

On dead bamboo (*Bambos*), Porto Rico:—continental North America.

6. **ISARIA** Pers. Tent. Disp. Fung. 41. 1797.

1. **Isaria Barberi** Giard. Compt. Rend. Soc. Biol. Paris **1894**: 823.

On larvae of *Diatraea saccharalis*, Porto Rico:—West Indies.

2. **Isaria Saussurei** Cooke, Veget. Wasps 53. 1892.

On *Botriocera* sp. on *Palicourea crocea* (Sw.) R. & S., Porto Rico:—West Indies.

3. **Isaria umbrina** Pers. Ann. Bot. Usteri **15**: 12. 1795.

On dead wood, Porto Rico:—Europe.

7. **ISARIOPSIS** Fries; Sacc. Michelia **2**: 33. 1880.

1. **Isariopsis griseola** Sacc. Myc. Ven. *1247;* Michelia **1**: 273. 1878.

On species of *Phaseolus*, Porto Rico:—Europe.

8. **PODOSPORIUM** Schw. Trans. Am. Phil. Soc. II. **4**: 278. 1832.

**1. Podosporium effusum** Pat. sp. nov.

Hyphae loosely fasciculate, subeffused, tobacco-brown, septate, crisped, 75–100 × 3 μ; conidia oblong or clavate, 12–30 × 3 μ, becoming 3-septate, not constricted. The longer ones are substipitate-contracted below, the shorter ones simply oblong.

The hyphae form patches 1–3 mm. diam. irregularly scattered over the upper surface of the leaf.

On leaves of *Piper* sp. near Rio Piedras, *Heller 142.*

**2. Podosporium pallidum** Pat. sp. nov.

Hyphae pale yellow, closely concrescent-fasciculate, forming a stilboid stipe ¼–½ mm. high and about 40 μ thick, the fibers slightly relaxed above; conidia fusoid, faintly nucleolate-septulate, pale yellowish, 25–30 × 4–5 μ.

On *Meliola amphitricha* Fries, on *Randia mitis* L. near Santurce.

**3. Podosporium ? penicillium** Speg. Bol. Acad. Ci. Cordoba **11**: 618. 1889.

On *Meliola* on species of *Psychotria grandis* Sw. and *Panicum glutinosum* Sw., Porto Rico:—continental South America.

9. **STILBELLA** Lindau in E. & P. Nat. Pfl. $1^2$: 489. 1900.

**1. Stilbella flavida** (Cooke) P. Henn. Bol. Mus. Goeldi **4**: 413. 1904.

*Stilbum flavidum* Cooke, Grevillea **9**: 11. 1880.

On various species of *Coffea* and a large variety of other hosts, Porto Rico:—Trinidad; Jamaica; continental America.

10. **STILBUM** Tode, Fungi Meckl. **1**: 10. 1790.

**1. Stilbum Heveae** (A. Zimm.) Sacc. & P. Sacc. Bull. Inst. Buitz. **1901**: 21.

*Stilbella Heveae* Zimm.; P. Henn. Hedwigia **41**: 148. 1902.

On stumps of wood, St. Thomas:—Java.

**2. Stilbum Karstenii** Sacc. Syll. Fung. **10**: 682. 1892.

*Stilbum nigripes* Karst. Hedwigia **28**: 195. 1889.

Associated with *Sphaerostilbe intermedia* Ferd. & Winge, St. Jan; St. Thomas:—continental South America.

Family 4. **TUBERCULARIACEAE.**

1. **AEGERITA** Pers. Tent. Disp. Fung. 40. 1797.

**1. Aegerita Webberi** Fawcett, Mycologia **2**: 167. 1910.

On *Aleurodiscus minimus* on *Psidium Guajava* L., Porto Rico:—continental North America.

2. **CLINOCONIDIUM** Pat. Bull. Soc. Myc. Fr. **14**: 156. 1898.

**1. Clinoconidium farinosa** (P. Henn.) Pat. Bull. Soc. Myc. Fr. **14**: 156. 1898.

See *Uredo farinosa.*

3. **EPICOCCUM** Link, Ges. Nat. Freunde Berlin Mag. **7**: 32. 1815.

**1. Epicoccum neglectum** Desm. Ann. Sci. Nat. II. **17**: 95. 1842.

On *Cestrum* sp., Porto Rico:—Europe; continental North America.

4. **EXOSPORIUM** Link, Ges. Nat. Freunde Berlin Mag. **3**: 9. 1809.

1. **Exosporium Leucaenae** Stevens & Dalbey, Mycologia **11**: 5. 1919.

On *Leucaena glauca* (L.) Benth., Porto Rico:—endemic.

5. **FUSARIUM** Link, Ges. Nat. Freunde Berlin Mag. **3**: 10. 1809.

1. **Fusarium cubense** Er. Smith, Science II. **31**: 755. 1910.

On *Musa paradisiaca* L., Porto Rico:—Cuba.
Causing a serious trunk rot.

2. **Fusarium Limonis** Bri. Att. Staz. Chim. Agr. Roma 485. 1876.

On *Citrus grandis* Osbeck [*Citrus decumana* L.], Porto Rico:—Europe.

3. **Fusarium meliolicolum** Stevens, Bot. Gaz. **65**: 244. 1918.

On *Meliola Paulliniae* Stevens, Porto Rico:—endemic.

4. **Fusarium radicicola** Wollenw. Jour. Agr. Res. **2**: 257. 1914.

On *Musa sapientum* L., Porto Rico:—Europe; continental North America.

5. **Fusarium Solani** (Mart.) Sacc. Michelia **2**: 296. 1881.

*Fusisporium Solani* Martius, Flora **26**: 546. 1843.

On *Vanilla Vanilla* (L.) Britton [*Vanilla planifolia* Andr.], Porto Rico:—Europe; continental North America.

6. **ILLOSPORIUM** Martius, Fl. Crypt. Erl. 325. 1817.

1. **Illosporium Commelinae** Stevens, Trans. Ill. Acad. Sci. **10**: 215. 1917.

On *Commelina longicaulis*, *C. elegans* H. B. K., Porto Rico:—endemic.

7. **MICROCERA** Desm. Ann. Sci. Nat. III. **10**: 359. 1848.

1. **Microcera Fujikuroi** Miyabe & Saw. Jour. Coll. Agr. Tohoku Imp. Univ. **5**: 83. 1913.

On scale insects on species of *Citrus*, Porto Rico:—continental North America.

8. **MUCHMORIA** Sacc. Ann. Myc. **4**: 277. 1906.

1. **Muchmoria portoricensis** Sacc. Ann. Myc. **4**: 277. 1906.

In cracks of the bark of an undetermined tree, Porto Rico:—endemic.

9. **MYROTHECIUM** Tode, Fungi Meckl. **1**: 25. 1790.

1. **Myrothecium verrucaria** (Albert. & Schw.) Ditm. in Sturm, Deuts. Fl. Pilze **1**: 7. 1813.

*Peziza verrucaria* Albert. & Schw. Consp. Fung. 340. 1805.

On dead leaves of *Saccharum officinarum* L., and dead twigs of *Citrus* sp., Porto Rico:—Europe; continental North America.

10. **PUCCINIOPSIS** Speg. Anal. Soc. Ci. Argent. **26**: 74. 1888.

1. **Pucciniopsis Caricae** (Speg.) Seaver, comb. nov.

*Cercospora ? Caricae* Speg. Anal. Soc. Ci. Argent. **22**: 205. 1886.
*Pucciniopsis Caricae* Earle, Bull. N. Y. Bot. Garden **2**: 340. 1902.

On *Carica Papaya* L., Porto Rico:—St. Thomas; Sanibel Island, Florida.

11. **SPEGAZZINIA** Michelia **2**: 37. 1880.

1. **Spegazzinia ornata** Sacc. Michelia **2**: 37. 1880.
On dead sugar cane and other plant debris, Porto Rico:—Europe.

12. **TRICHOSTROMA** Corda in Sturm, Deuts. Fl. Pilze **9**: 131. 1829.

1. **Trichostroma Axonopi** Tehon, Bot. Gaz. **67**: 510. 1919.
On *Axonopus compressus* (Sw.) Beauv., Porto Rico:—endemic.

13. **TUBERCULARIA** Tode, Fungi Meckl. **1**: 18. 1790.

1. **Tubercularia coccicola** Stevenson, Ann. Rep. Ins. Exp. Sta. 1916–1917: 92.
On scale insects on *Citrus* sp., Porto Rico:—endemic.

2. **Tubercularia saccharicola** Speg. Rev. Agr. Univ. La Plata **1896**: 254.
On dead sugar cane stalks, Porto Rico:—continental South America.

3. **Tuberculina persicina** (Ditm.) Sacc. Fungi Ital. *f. 964*. 1881.
*Tubercularia persicina* Ditm. in Sturm, Deuts. Fl. Pilze **1**: 99. 1817.
On *Puccinia Rauliaerii* Ferd. & Winge, St. Thomas:—Europe.

Sterile Mycelium.

1. **HIMANTIA** Pers. Myc. Eu. **1**: 88. 1822.

1. **Himantia stellifera** Johnston, Jour. Dept. Agr. Porto Rico **1**: 188. 1917.
On various grasses and sedges, Porto Rico:—endemic.

2. **OZONIUM** Pers. Myc. Eu. **1**: 86. 1822.

1. **Ozonium stuposum** Pers. Myc. Eu. **1**: 87. 1822.
*Dematium stuposum* Pers. Syn. Fung. 696. 1801.
Reported from the Schwanecke collection for Porto Rico:—Europe.

3. **RHIZOCTONIA** DC. Fl. Fr. **6**: 110. 1815.

1. **Rhizoctonia alba** Matz, Jour. Dept. Agr. Porto Rico **5**: 29. 1921.
On decaying leaves of celery, Porto Rico:—endemic.

2. **Rhizoctonia dimorpha** Matz, Jour. Dept. Agr. Porto Rico **5**: 20. 1921.
On cowpea and *Phaseolus* sp., Porto Rico:—endemic.

3. **Rhizoctonia ferrugena** Matz, Jour. Dept. Agr. Porto Rico **5**: 28. 1921.
On sugar cane roots, Porto Rico:—endemic.

4. **Rhizoctonia grisea** (Stevenson) Matz, Jour. Dept. Agr. Porto Rico **5**: 22. 1921.
*Sclerotium griseum* Stevenson, Jour. Dept. Agr. Porto Rico **2**: 220. 1918.
On *Musa paradisiaca* L., *Saccharum officinarum* L., and *Zea Mays* L., Porto Rico:—endemic.

5. **Rhizoctonia macrosclerotia** Matz, Jour. Dept. Agr. Porto Rico **5**: 19. 1921.

On petioles and stems of *Phaseolus* sp., Porto Rico:—endemic.

6. **Rhizoctonia Melongena** Matz, Jour. Dept. Agr. Porto Rico **5**: 29. 1921.

On decaying egg plant, Porto Rico:—endemic.

7. **Rhizoctonia microsclerotia** Matz, Phytopathology **7**: 117. 1917.

On cowpea, carrot, bean and hollyhock, Porto Rico:—continental North America.

8. **Rhizoctonia palida** Matz, Jour. Dept. Agr. Porto Rico **5**: 28. 1921.

On cane roots, pepper roots and young corn seedlings, Porto Rico:—endemic.

9. **Rhizoctonia Solani** Kuhn, Krankh. Kulturg. 224. 1858.

On bean pods, grapefruit seedlings, celery, tomato stems, lettuce leaves, sugar cane roots, banana roots, peas and various other garden plants, Porto Rico:—Europe.

4. **SCLEROTIUM** Tode, Fungi. Meckl. **1**: 2. 1790.

1. **Sclerotium bataticola** Taub. Phytopathology **3**: 71. 1913.

On *Ipomoea Batatas* (L.) Lam., Porto Rico:—continental North America. Causing charcoal rot.

2. **Sclerotium griseum** Stevenson, Jour. Dept. Agr, Porto Rico **2**: 220. 1918.

See *Rhizoctonia griseum.*

3. **Sclerotium portoricense** Stevens, Trans. Ill. Acad. Sci. **10**: 215. 1917.

On *Capriola Dactylon* (L.) Pers., Porto Rico:—endemic.

4. **Sclerotium Rolfsii** Sacc. Ann. Myc. **9**: 257. 1911.

On various hosts especially on herbaceous plants, Porto Rico:—continental North America.

Specimen reported by Stevens as *Claviceps Paspali* is known only from the sclerotial stage and may be the above species.

5. **Sclerotium vulgatum** Fries, Obs. Myc. **1**: 204. 1815.

On human excrement, St. Thomas:—Europe.

Fungi of Unknown Affinity.

1. **GRAPHIOLA** Poit. Ann. Sci. Nat. I. **3**: 473. 1824.

1. **Graphiola congesta** Berk. & Rav.; Berk. Grevillea **3**: 58. 1874.

On unknown host, Porto Rico:—continental North America.

2. **Graphiola Phoenicis** (Moug.) Poit. Ann. Sci. Nat. I. **3**: 473. 1824.

*Phacidium Phoenicis* Moug.; Fries, Syst. Myc. **2**: 572. 1823.

On *Sabal causiarum* (Cook) Beccari [*Inodes causiarum* Cook], *Phoenix dactilifera* L., and *Thrinax microcarpa* Sargent [*Thrinax praeceps* Cook], Porto Rico:—continental North America; Europe; Africa; Ceylon.

2. **GRALLOMYCES** Stevens, Bot. Gaz. **65**: 245. 1918.

1. **Grallomyces portoricensis** Stevens, Bot. Gaz. **65**: 245. 1918.

On various hosts associated with *Meliola*, Porto Rico:—endemic.

## Sub-class 4. HEMIBASIDIOMYCETES.

By F. D. Kern and H. H. Whetzel.

### Order 1. USTILAGINALES.

Parasitic fungi on various organs of herbaceous flowering plants. Mycelium localized or systemic; hyphae hyaline, branched, more or less septate, intercellular. Fertile mycelium compacting into masses or sori, forming chlamydospores of various types from the internal contents of the cells; in a few cases developing external conidia; at maturity disappearing more or less through gelatinization. Sori usually evident forming mostly brown or black, dusty or agglutinated spore masses. Chlamydospores light to dark colored 4–35 μ in diameter unicellular or composed of 2 to several cells; in some genera forming spore balls. Germination by promycelium usually bearing sporidia (basidiospores) of some type which often multiply by budding.

Promycelium usually with lateral sporidia at septa. Fam. 1. Ustilaginaceae.
Promycelium with clustered terminal sporidia. Fam. 2. Tilletiaceae.

### Family 1. USTILAGINACEAE.

Sori usually forming dusty or agglutinated spore masses; commonly brown or black. Promycelium bearing lateral sporidia or none.

#### 1. USTILAGO (Pers.) Roussel, Fl. Calvados ed. 2. 47. 1806.

Sori at maturity consisting of dusty usually dark colored spore masses. Spores single; small to medium in size; reddish, olivaceous, black-brown, golden-brown, yellow or violet to purple.

**1. Ustilago affinis** Ellis & Ev.; Cockerell, Bull. Torrey Club **20:** 297. 1893.

*Ustilago Hilariae* P. Henn. Hedwigia **37:** 267. 1898.
*Ustilago Stenotaphri* P. Henn. Hedwigia **37:** 293. 1898. Not *U. Stenotaphri* of McAlpine.
*Ustilago americana* Speg. Anal. Mus. Nac. Buenos Aires **6:** 207. 1899.
*Ustilago Henningsii* Sacc. & Syd. in Sacc. Syll. Fung. **16:** 368. 1902.

On *Stenotaphrum secundatum* (Walt.) Kuntze.
One of the commonest smuts in Porto Rico and Vieques:—Bermuda, Jamaica, and Mexico.

**2. Ustilago Schröteriana** (?) P. Henn. Hedwigia **35:** 215–216. 1896.

On *Paspalum* sp. Johnston *N. Y. Bot. Gard. (4)641.*
This species is listed by Stevenson (Jour. Dept. Agr. Porto Rico **2:** 162, 1918) as *Sphacelotheca Paspali-notati.* The specimen (Johnston *4641*) on which he presumably founded his record is clearly not to be referred to that species and is probably *U. Schröteriana* as pointed out in the article by Whetzel and Kern (Mycologia **18:** 117. 1926).
The single specimen above recorded is known from Porto Rico:—type from Brazil.

**Ustilago segetum** Dittm.

A smut is listed under this name by Klotzsch (Linnaea **25:** 364–366. 1852) from Schwanecke's Porto Rican collections. No host is given. As this is an old name applied collectively to the smuts of cereals it is impossible to determine just what species he had. His specimen has not been seen.

3. **Ustilago Tritici** (Pers.) Rostr. Overs. K. Danske Vid. Selsk. Forh. **1890:** 15. March 1890.

*Uredo segetum Tritici* Pers. Tent. Disp. Fung. 57. 1797.
*Ustilago segetum Tritici* Jens. Om Korns. Brand 61. 1888.
*Ustilago Tritici* Jens.; Kellerm. & Swing. Ann. Rept. Kansas Agr. Exp. Sta. **2:** 262. June 1890.
*Ustilago Tritici f. folicola* P. Henn. Zeitschr. Pflanzenkr. **4:** 139. 1894.

On *Triticum aestivum* L. (*T. vulgare* Vill.).

But one collection of this smut is known to the writers from Porto Rico, that by C. M. Tucker, his number *300* (= Cornell Univ. Herb. No. *14936*). Common in all temperate regions where wheat is grown.

4. **Ustilago Zeae** (Beckm.) Unger. Einfl. Bodens. 211. 1836.

*Lycoperdon Zeae* Beckm. Hannov. Mag. **6:** 1330. 1768.
*Ustilago Maydis* Corda, Ic. Fung. **5:** 3. 1842.
*Ustilago Zeae-Mays* Wint. Rab. Krypt. Fl. **1**[1]: 97. 1881.

On *Zea Mays* L.

Recorded by Clinton from Porto Rico but not represented in his 1904 collection. Reported also by Stevens and Stevenson. There is also a specimen in the collection of C. M. Tucker, his No. *301*.

Apparently not common in Porto Rico:—occurring wherever maize is grown.

2. **SPHACELOTHECA** DeBary, Verg. Morph. Biol. Pilze 187. 1884.

Sori usually in the inflorescence, often limited to the ovary, covered by a false membrane and having a central columella in the dusty spore mass. Spores single; reddish-brown, small to medium.

1. **Sphacelotheca Panici-leucophaei** (Bref.) Clinton, N. Am. Fl. **7:** 28. 1906.

*Ustilago Panici-leucophaei* Bref. Unters. Gesammt. Myk. **12:** 114. 1895.
*Ustilago insularis* P. Henn. Hedwigia **35:** 51. 1896.

On *Valota insularis* (L.) Chase.

The entire inflorescence is converted into a dull brown dusty mass as it emerges from the upper leaf sheath. A very common smut in Porto Rico and Vieques:—Cuba, Jamaica, Central and South America, Mexico, and Arizona.

**Sphacelotheca Paspali-notati** (P. Henn.) Clinton.

See *Ustilago Schröteriana* P. Henn.

2. **Sphacelotheca Sorghi** (Link) Clinton, Jour. Myc. **8:** 140. 1902.

*Sorosporium Sorghi* Link, in Willd. Sp. Pl. **6**[2]: 86. 1825.
*Tilletia Sorghi-vulgaris* Tul. Ann. Sci. Nat. III. **7:** 116. 1847.
*Ustilago Sorghi* Pass.; Thüm. Hedwigia **12:** 114. 1873.
*Ustilago Tulasnei* Kühn, Ber. Sitz. Nat. Ges. Halle **1874:** 5. 1874.
*Cintractia Sorghi-vulgaris* Clinton, Bull. Ill. Agr. Exp. Sta. 47: 404. 1897.

On *Holcus Sorghum* L. (*Sorghum vulgare* Pers.).

A single collection by C. M. Tucker, his No. *258*, (= Cornell Univ. Herb. No. *12638*) is known to the writers from Porto Rico:—Cuba, Jamaica, Canada, United States, Europe, Asia, and Africa.

3. **CINTRACTIA** Cornu, Ann. Sci. Nat. VI. **15:** 279. 1883.

Sori on various organs of the host, often in the ovaries, consisting of a black rather firm agglutinated spore mass; spores single, medium to large, formed about a central columella.

1. **Cintractia axicola** (Berk.) Cornu, Ann. Sci. Nat. VI. **15**: 279. 1883.

*Ustilago axicola* Berk. Ann. Mag. Nat. Hist. II. **9**: 200. 1852.
*Ustilago Fimbristylis* Thüm. Bull. Torrey Club **6**: 95. 1876.

On *Fimbristylis diphylla* (Retz.) Vahl.
*Fimbristylis ferruginea* (L.) Vahl.

Very common in Porto Rico; also recorded from St. Thomas and Tortola:—southern U. S., Mexico, Central America, Cuba, Jamaica, Santo Domingo, and St. Kitts.

2. **Cintractia leucoderma** (Berk.) P. Henn. Hedwigia **34**: 335. 1895.

*Ustilago leucoderma* Berk. Ann. Mag. Nat. Hist. II. **9**: 200. 1852.
*Cintractia Krugiana* P. Magn. Bot. Jahrb. **17**: 490. 1893.
*Cintractia affinis* Peck, N. Y. State Mus. Bull. **67**: 28. 1903.

On *Rynchospora corymbosa* (L.) Britton.
*Rynchospora cyperoides* (Sw.) Mart.
*Rynchospora gigantea* Link.

Known by the long white covered sori which involve the pedicels and peduncles of the inflorescence.

Locally very abundant in Porto Rico on *R. corymbosa*, especially along streams about San Juan. Often occurring along with *C. utriculicola* on this host:—Florida, New York, Isle of Pines, Cuba, Santo Domingo, Mexico, Central America, South America, Asia, and Australia.

3. **Cintractia limitata** Clinton, Proc. Boston Soc. Nat. Hist. **31**: 399. 1904.

On *Cyperus ligularis* L. (*Mariscus ligularis* Urban).

Apparently common. Known only from Porto Rico, Mayaguez, Manati Santurce, Boqueron and San Juan being the stations recorded.

4. **Cintractia minor** Jackson, Mycologia **12**: 153. 1920.

*Cintractia axicola minor* Clinton, Jour. Myc. **8**: 143. 1902.

On *Cyperus sphacelatus* Rottb.

This appears to be a rather uncommon species in Porto Rico. The only other places from which it is reported are New York, New Jersey and Delaware where it occurs on *Cyperus Grayi* (Jackson, Mycologia **12**: 153).

5. **Cintractia utriculicola** (P. Henn.) Clinton, Jour. Myc. **8**: 143. 1902.

*Cintractia leucoderma f. utriculicola* P. Henn. Hedwigia **34**: 336. 1895.
*Cintractia axicola f. spicularum* Juel. Bih. Sv. Vet.-Akad. Handl. **23** (3)[10]: 7. 1897.

On *Rynchospora corymbosa* (L.) Britton (*Rynchospora aurea* Vahl).

Occurring frequently along with *C. leucoderma* on this host. Apparently not common in Porto Rico:—Mexico, Trinidad, and South America.

4. **MYKOSYRINX** G. Beck, Ann. Nat. Hofmus. Wien **9**: 123. 1894.

Sori inside pedicels and peduncles of the inflorescence forming a double layered fertile stroma lining these organs; spore mass dusty; spores in pairs.

1. **Mykosyrinx Cissi** (DC.) G. Beck, Ann. Nat. Hofmus. Wien **9**: 123. 1894.

*Uredo Cissi* DC. in Poir. Encycl. Meth. Bot. **8**: 228. 1808.
*Geminella exotica* Schröt. Hedwigia **15**: 135. 1876.
*Schroeteria Cissi* De-Toni, in Sacc. Syll. Fung. **7**: 501. 1888.

On *Cissus erosa* L. C. Rich.
*Cissus sicyoides* L.
*Cissus trifoliata* L. (*C. acida* L.).

Apparently once common in Porto Rico. Not found in recent collections:—Florida, Mexico, Cuba, Bahamas, Isle of Pines, Jamaica, Santo Domingo, Trinidad, Central America, South America, and Africa.

### 5. **THECAPHORA** Fingerh. Linnaea **10**: 230. 1835.

Sori in various organs of the host, forming indefinite masses in the floral organs or firm galls on the stems and leaves; spore mass at maturity dusty; spore balls of few to many fertile cells, permanently united, spores yellowish or reddish.

1. **Thecaphora pustulata** Clinton; Chardon, Revista Agr. Puerto Rico **6**[4]: 23. 1921.

On *Bidens pilosa* L. (*B. leucantha* Willd.).

Causing soft gall-like swellings of various sizes up to an inch in diameter on stems, leaves and petioles.

Frequent throughout Porto Rico:—Not known elsewhere.

### 6. **TOLYPOSPORELLA** Atk. Cornell Univ. Agr. Exp. Sta. Bull. **3**[1]: 16. 1897.

Sori usually on the leaves forming a black granular agglutinated coating; spore balls variable; spores dark colored, with a very thick often sac-like epispore.

1. **Tolyposporella Brunkii** (Ellis & Gall.) Clinton, Jour. Myc. **8**: 147. 1902.

*Ustilago* (*Sorosporium* ?) *Brunkii* Ellis & Gall. Jour. Myc. **6**: 31. 1890.

*Ustilago apiculata* Ellis & Gall.; Jennings, Texas Agr. Exp. Sta. Bull. **9**: 29. 1890.

On *Andropogon bicornis* L.

Black linear sori mostly along midrib of leaf, underside. Known in Porto Rico from a single collection by Whetzel & Olive No. *449* from El. Yunque:—Texas and Mexico.

2. **Tolyposporella Sporoboli** Jackson; Whetzel & Kern, Mycologia **18**: 122. 1926.

On *Sporobolus indicus* (L.) R. Br.

Known only from Porto Rico from a single collection by Whetzel & Olive No. *450* from the mountain side of El Yunque, 1916.

## Family 2. **TILLETIACEAE**.

Sori forming dusty erumpent spore masses or permanently imbedded in the tissues. Promycelium bearing a terminal cluster or tuft of elongate sporidia.

**Urocystis cepulae** Frost.

On *Allium Cepa* L. Mentioned by Henricksen (Agr. Exp. Sta. Porto Rico Bull. **7**: 45. 1906).

No specimens of this from Porto Rico known. According to Stevenson this smut probably does not occur there (Jour. Dept. Agr. Porto Rico **2**: 163. 1918.).

### 1. **ENTYLOMA** DeBary, Bot. Zeit. **32**: 101. 1874.

Sori usually in the leaves, generally forming whitish or discolored areas, permanently imbedded in the tissues; spores single, hyaline to yellow or reddish-yellow, occasionally dark colored.

1. **Entyloma australe** Speg. Anal. Soc. Ci. Argent. **10**: 5. July 1880.

*Protomyces Physalidis* Kalchb. & Cooke, Grevillea **9**: 22. Sept. 1880.
*Entyloma Besseyi* Farl. Bot. Gaz. **8**: 275. 1883.
*Entyloma Physalidis* Wint. Hedwigia **22**: 130. 1883.

On *Physalis pubescens* L. Clinton's specimen (N. Am. Fl. **7**: 64. 1906.) so determined by N. L. Britton. Four collections known from Porto Rico:—United States, Canada, South America, and Africa.

2. **Entyloma guaraniticum** Speg. Anal. Soc. Ci. Argent. **17**: 127. 1884.

On *Bidens pilosa* L. (*B. leucantha*).
Pale white spots on the leaves.
There are but three collections of this from Porto Rico known to the writers. Probably common, especially at high altitudes. Inconspicuous and hence easily overlooked:—Massachusetts (?), Florida, and South America.

3. **Entyloma Lobeliae** Farl. Bot. Gaz. **8**: 275. 1883.

On *Lobelia Cliffortiana* L. (Host determined by N. L. Britton).
Clinton's collection is the only one known to the writers from Porto Rico. (See Whetzel & Kern, Mycologia **18**: 123. 1926.) Known otherwise only from North America on *Lobelia inflata*.

2. **BURRILLIA** Setch. Proc. Am. Acad. **26**: 18. 1891.

Sori generally in the leaves, rather permanently imbedded in the tissues; spore balls without a distinct cortex of sterile cells, conspicuous; spores hyaline or yellowish, rather firmly united.

1. **Burrillia Echinodori** Clinton, Jour. Myc. **8**: 154. 1902.

On *Echinodorus cordifolius* (L.) Griseb.
Stevens made a single collection in Porto Rico. There is also a specimen in the private collection of John A. Stevenson; apparently rare:—Florida and California.

**Doassansia Sintenisii** Bres.

On *Cedrela odorata* L.
Clinton (N. Am. Fl. **7**: 71. 1906) excludes this species remarking "Probably insect work." A re-examination of Sintenis' specimens confirms Clinton's diagnosis.

## Order 2. UREDINALES.

The Uredinales, popularly known as rusts, are small, mostly microscopic fungi, parasitic in the tissues of the higher plants (Filicales and Spermatophyta). Many species have spores of five kinds, pycniospores, aeciospores, urediniospores, teliospores, and basidiospores. The first four may occur in regular succession upon one sort of host plant in the order named, but in many species there is a striking change of hosts (heteroecism), a definite part of the life cycle being produced quite apart and dissociated from the other part. The spores are borne in definite groups called sori (rarely singly), covered at least at first by overlying host tissue and set free by early rupture or by weathering. The sori of the foregoing spore-forms are designated pycnia, aecia, uredinia, and telia. In the tropics it is especially notable that many of the species have inconspicuous sori. The urediniospores are repeating spores, i.e., they may reproduce themselves over and over indefinitely under favorable conditions. In the tropics many species perpetuate themselves in the uredinial stage and the rest of the life-history is unknown.

Teliospores germinating by dividing internally into basidia; teliospores compacted laterally into waxy layers. Fam. 1. Coleosporiaceae.
Teliospores germinating with external basidia.
Teliospores compacted laterally into crusts or columns or occasionly solitary within the tissues. Fam. 2. Melampsoraceae.
Teliospores fasicicled or free. Fam. 3. Pucciniaceae.

## Family 1. **COLEOSPORIACEAE.**

Teliospores compacted laterally into flattened waxy, cushion-like masses, germinating upon maturity by dividing internally into four basidia. This family is represented in Porto Rico by the genus *Coleosporium.*

### 1. **COLEOSPORIUM** Lév. Ann. Sci. Nat. III. **8**: 373. 1847.

The genus has all four spore-stages, heteroecious, the aecia being the blister rusts on the leaves (not on the twigs or bark) of pines (*Pinus*). In Porto Rico common in the uredinial stage, which is yellowish and powdery.

1. **Coleosporium Elephantopodis** (Schw.) Thüm. Myc. Univ. *953.* 1878.

*Uredo Elephantopodis* Schw. Schr. Nat. Ges. Leipzig **1**: 70. 1822.

On *Elephantopus mollis* H.B.K.

This rust is reported on *E. scaber* (N. Am. Fl. **7**: 90) an error for *E. mollis. E. scaber* is restricted to the Eastern Hemisphere.

Common throughout Porto Rico:—southeastern United States, Central America, Cuba, Jamaica, St. Vincent, South America.

2. **Coleosporium Eupatorii** Arth. Bull. Torrey Club **33**: 31. 1906.

On *Hebeclinium macrophyllum* (L.) DC. (*Eupatorium macrophyllum* L.).

First and only report of this species in Porto Rico by Stevenson, Jour. Dept. Agr. Porto Rico **2**: 163. 1918:—Central America, Cuba.

3. **Coleosporium Ipomoeae** (Schw.) Burr. Bull. Ill. Lab. Nat. Hist. **2**: 217. 1885.

*Uredo Ipomoeae* Schw. Schr. Nat. Ges. Leipzig **1**: 70. 1822.

On *Ipomoea angustifolia* Jacq.
*Ipomoea Batatas* (L.) Lam.
*Ipomoea littoralis* Blume. Holway specimen (Arthur, Mycologia **7**: 172). probably a misdetermination for *I. stolonifer* (Botany, Porto Rico and Virgin Islands **6**: 113).
*Ipomoea Nil* (L.) Roth.
*Ipomoea rubra* (Vahl) Millsp.
*Ipomoea stolonifera* (Cyrill) Poir.
*Ipomoea tiliacea* (Willd.) Choisy.
*Quamoclit coccinea* (L.) Moench.
*Thyella tamnifolia* (L.) Raf. (*Jacquemontia tamnifolia* (L.) Griseb.).

Common in Porto Rico. Reported on the last host only from Vieques and St. Croix:—southeastern United States, Central America, Mexico, Jamaica, South America.

4. ***Coleosporium Plumierae** Pat. Bull. Soc. Myc. Fr. **18**: 178. 1902.

On *Plumiera alba* L.
*Plumiera Krugii* Urban.
*Plumiera obtusa* L.

Rather rare in Porto Rico; known on *P. obtusa* in this flora only from Mona Island:—Cuba, Guadaloupe.

* See note, p. 144.

Family 2. **MELAMPSORACEAE** (Uredinaceae).

Teliospores compacted laterally into flattened crusts, filiform columnar masses, or sometimes solitary within the tissues (except in *Olivea*); basidia external.

## PHYSOPELLA.

For species formerly referred to this genus see *Phakopsora.*

1. **PHAKOPSORA** Diet. Ber. Deuts. Bot. Ges. **13:** 334. 1895.

Telia laterally expanded, the teliospores one-celled, catenulate, compacted; uredinia with delicate peridium, with peripheral, free or imbricated paraphyses, or naked, the urediniospores catenulate, falling away at maturity.

1. **Phakopsora** (?) **Aeschynomensis** Arth. Bull. Torrey Club **44:** 509. 1917.
*Uredo Aeschynomensis* Arth. Bot. Gaz. **39:** 392. 1905.
*Physopella* (?) *Aeschynomensis* Arth. N. Am. Fl. **7:** 104. 1907.
On *Aeschynomene americana* L.
Collected throughout Porto Rico by Stevens during October and November only:—Cuba, Mexico, South America.

2. **Phakopsora fenestrala** Arth. Bull. Torrey Club **44:** 508. 1917.
*Uredo fenestrala* Arth. Mycologia **7:** 332. 1915.
*Schroeteriaster fenestrala* Arth. Mycologia **8:** 24. 1916.
On *Cicca disticha* L. (*Phyllanthus distichus* Muell.-Arg.).
*Asterandra grandifolia* (L.) Britton. (*Phyllanthus grandifolius* L.).
*Phyllanthus Niruri* L.
Rather common throughout Porto Rico and Vieques especially on *C. disticha.* Known also from Santo Domingo.

3. **Phakopsora Meibomiae** Arth. Bull. Torrey Club **44:** 509. 1917.
*Physopella Meibomiae* Arth. Mycologia **9:** 59. 1917.
On *Meibomia supina* (Sw.) Britton (*Desmodium supinum* DC.).
Known from Porto Rico, Añasco hillsides (type locality) and from along the Tanama River, the only collections being those of Whetzel and Olive:—Santo Domingo and South America.

4. **Phakopsora tecta** Jackson & Holway; Jackson, Mycologia **18:** 148. 1926.
? *Uredo Commelyneae* Kalchbr. Grevillea **11:** 24. 1882. Not Speg. 1880.
On *Commelina elegans* H.B.K.
*Commelina longicaulis* Jacq. (*C. nudiflora* authors not L.).
*Commelina virginica* L. Specimens listed under this species now referred to *C. elegans.*
Porto Rico, Vieques and St. Thomas:—Trinidad, South America, and southern Africa.

5. **Phakopsora Vignae** (Bres.) Arth. Bull. Torrey Club **44:** 509. 1917.
*Uredo Vignae* Bres. Rev. Myc. **13:** 66. 1891.
*Uredo Sojae* P. Henn. Hedwigia Beibl. **42:** 108. 1903. Not *Uromyces Sojae* Sydow 1906.
*Uredo concors* Arth. Mycologia **7:** 330. 1915.
*Physopella concors* Arth. Mycologia **9:** 60. 1917.
On *Dolichos Lablab* L.
*Phaseolus lunatus* L.
*Teramnus uncinatus* (L.) Sw.

Known only in the uredinial stage. Apparently rare in Porto Rico, only four collections recorded; also in St. Thomas:—Cuba, Trinidad, Java, Japan, and Philippine Islands. (Cf. N. Am. Fl. **7**: 673).

6. **Phakopsora Vitis** (Thüm.) Syd. Hedwigia **38**: 141. 1899.

*Uredo Vitis* Thüm. Pilze Weinst. 182. 1878.
*Uredo Vialae* Lagerh. Compt. Rend. Acad. Sci. Paris **110**: 729. 1890.
*Physopella Vitis* Arth. Résult. Sci. Congr. Bot. Vienne 338. 1906.

On *Vitis vinifera* L.

Known in this region only in the uredinial stage. Telia reported from southern United States (Phytopathology **14**: 171).

Reported from several stations in Porto Rico.:—southeastern United States, Cuba, Jamaica, South America, and Japan.

## SCHROETERIASTER.

For species formerly referred to this genus see *Phakopsora*.

### 2. OLIVEA Arth. Mycologia **9**: 60. 1917.

Uredinia with a mass of incurved paraphyses united at the base and forming a globose basket, the urediniospores stellately angular; the teliospores replacing the urediniospores in the basket of paraphyses, free, one-celled. Cycle of development also includes deep-seated aecia and mammilliform pycnia.

1. **Olivea capituliformis** (P. Henn.) Arth. Mycologia **9**: 61. 1917.

*Uredo capituliformis* P. Henn. Hedwigia **34**: 97. 1895.
*Ravenelia capituliformis* P. Henn. Hedwigia **43**: 160. 1904.

On *Alchornea latifolia* Sw.

An interesting tree rust. Common in Porto Rico but inconspicuous:—Tortola, Brazil.

2. **Olivea Petitiae** Arth. Mycologia **9**: 62. 1917.

On *Petitia domingensis* Jacq.

Known only from the type locality in Porto Rico.

### 3. MILESIA F. B. White, Scott. Nat. **4**: 162. 1877.

Teliospores within the epidermal cells or between the mesophyll cells; urediniospores pointed and smooth, or obovate and spinulose.

1. **Milesia australis** Arth. Bull. Torrey Club **51**: 53. 1924.

*Uredo Blechni* Diet. & Neger. Bot. Jahrb. **22**: 358. 1896. Not *Milesia Blechni* Arth. 1922.

On *Blechnum occidentale* L.
*Polytaenium Feei* (Schaffn.) Maxon.

Two collections from Porto Rico:—Salvador, Trinidad, South America.

2. **Milesia columbiensis** (Dietel) Arth. Mycologia **7**: 175. 1915.

*Milesina columbiensis* Dietel; Mayor, Mem. Soc. Neuch. Sci. **5**: 559. 1913.

On *Nephrolepis rivularis* (Vahl) Mett.

Rare in Porto Rico:—South America.

### 4. CROSSOPSORA Syd. Ann. Myc. **16**: 343. 1918.

Telia erumpent, the teliospores catenulate and adhering to form a filiform column, somewhat horny when dry; uredinia erumpent, dehiscent by a central

pore, the urediniospores borne singly on pedicels, the walls colored or nearly colorless, echinulate, the pores obscure; the cycle of development imperfectly known, only uredinia and telia recognized.

1. **Crossopsora notata** Arth. N. Am. Fl. **7:** 695. 1925.

*Uredo notata* Arth. Mycologia **9:** 89. 1917.
*Cronartium notatum* Arth. Mem. Torrey Club **17:** 114. 1918.

On *Byrsonima crassifolia* (L.) H.B.K.

Known from Porto Rico by a single collection of Whetzel and Olive from Mayaguez:—Cuba.

5. **CEROTELIUM** Arth. Bull. Torrey Club **33:** 30. 1906.

Telia erect, somewhat waxy, erumpent, becoming pulverulent at surface, the teliospores one-celled, catenulate, the terminal spores readily separating upon germination; uredinia as in *Phakopsora*.

1. **Cerotelium alienum** (Syd. & Butler) Arth. N. Am. Fl. **7:** 698. 1925.

*Chrysomyxa aliena* Syd. & Butler, Ann. Myc. **10:** 267. June, 1912.
*Uredo Spondiadis* Petch, Ann. Bot. Garden Peradeniya **5:** 248. Aug. 1912.
*Kuehneola aliena* Syd. & Butler; Sydow, Monog. Ured. **3:** 322. 1914.
*Cerotelium Spondiadis* Arth. Bull. Torrey Club **44:** 510. 1917.

On *Spondias Mombin* L.

A single collection known from Porto Rico by Seaver and Chardon taken near Manati, Mar. 30, 1923. Otherwise reported only from India.

2. **Cerotelium Canavaliae** Arth. Bull. Torrey Club **33:** 30. 1906.

On *Canavali ensiformis* (L.) DC.
*Canavali gladiata* DC. Considered by Britton a synonym of *C. ensiformis* (L.) DC. Botany, Porto Rico and Virgin Islands **5:** 419.

Known only from Porto Rico.

3. **Cerotelium desmium** (Berk. & Br.) Arth. N. Am. Fl. **7:** 698. 1925.

*Aecidium desmium* Berk. & Br. Jour. Linn. Soc. **14:** 95. 1875.
*Uredo Gossypii* Lagerh. Jour. Myc. **7:** 48. 1891.
*Kuehneola Gossypii* Arth. N. Am. Fl. **7:** 187. 1912.
*Cerotelium Gossypii* Arth. Bull. Torrey Club **44:** 510. 1917.

On *Gossypium barbadense* L.
*Gossypium brasiliense* Macfad.
*Gossypium hirsutum* L.
*Montezuma speciosissima* Sessé & Moc. (*Thespesia grandiflora* DC.).

Common in Porto Rico on the tree cottons and also injurious to the cultivated sea island cotton; recorded on the latter from Mona:—Florida, Cuba, South America, India, Java, New Guinea, Philippines.

4. **Cerotelium Fici** (Cast.) Arth. Bull. Torrey Club **44:** 509. 1917.

*Uredo Fici* Cast.; Desmaz. Pl. Crypt. (Fasc. 34) *1662*. 1848.
*Uredo ficina* Juel, Bih. Sv. Vet.-Akad. Handl. **23** (3)[10]: 25. 1897.
*Kuehneola Fici* Butler, Ann. Myc. **12:** 76. 1914.

On *Ficus Carica* L.
*Ficus crassinervia* Desf.
*Ficus laevigata* Vahl.
*Ficus lentiginosa* Vahl. Now regarded as a synonym of *F. laevigata* Vahl, Botany, Porto Rico and Virgin Islands **5:** 237.
Note:—The report of this species on *Carica Papaya* L. (Mycologia **9:** 63) an error.

Common in the uredinial form throughout Porto Rico especially on *F. laevigata:*—southeastern United States, Central America, Cuba, South America, Europe, and in all tropical regions (chiefly as uredinia).

6. **ENDOPHYLLOIDES** Whetzel & Olive, Am. Jour. Bot. **4**: 50. 1917.

Aecia erumpent, the teliospores one-celled, catenulate, the columns waxy or horny when dry; peridium wanting or inconspicuous.

1. **Endophylloides portoricensis** Whetzel & Olive, Am. Jour. Bot. **4**: 51. 1917.

*Aecidium expansum* Arth. Mycologia **7**: 317. 1915. Not *A. expansum* Diet.

*Cronartium portoricensis* Sacc. & Trott. in Sacc. Syll. Fung. **23**: 851. 1925.

On *Mikania cordifolia* (L. f.) Willd.
*Mikania fragilis* Urban.
*Mikania odoratissima* Urban.
*Mikania Stevensiana* Britton (Britton & Cowell, Phan. Spec. No. *4225*).
*Mikania* sp. (See Botany, Porto Rico & Virgin Islands **6**: 293.)

Common in Porto Rico, especially on the first named host:—Panama, Guatemala, Salvador, Trinidad.

7. **ENDOPHYLLUM** Lév. Mem. Soc. Linn. Paris **4**: 208. 1825.

Aecia aecidioid, pulverulent, the teliospores catenulate, one-celled, the wall colored, verrucose; peridium evanescent.

1. **Endophyllum circumscriptum** (Schw.) Whetzel & Olive, Am. Jour. Bot. **4**: 49. 1917.

*Aecidium circumscriptum* Schw.; Berk. & Curt. Jour. Phila. Acad. Sci. II. **2**: 283. 1853.

*Aecidium Cissi* Wint. Hedwigia **23**: 168. 1884.

On *Cissus sicyoides* L.

Very common and abundant in Porto Rico; also in St. Thomas:—Central America, Cuba, Jamaica, Trinidad, South America.

2. **Endophyllum decoloratum** (Schw.) Whetzel & Olive, Am. Jour. Bot. **4**: 49. 1917.

*Aecidium decoloratum* Schw.; Berk. & Curt. Jour. Phila. Acad. Sci. II. **2**: 283. 1853.

*Aecidium Wedeliae* Earle, Muhlenbergia **1**: 16. 1901.

*Aecidium Clibadii* Syd. Ann. Myc. **1**: 333. 1903.

*Endophyllum Wedeliae* Whetzel & Olive, Am. Jour. Bot. **4**: 49. 1917.

On *Clibadium erosum* (Sw.) DC.
*Wedelia trilobata* (L.) Hitchc.

Common in Porto Rico, especially on *Wedelia:*—Mexico, Guatemala, Trinidad, South America.

3. **Endophyllum Stachytarphetae** (P. Henn.) Whetzel & Olive, Am. Jour. Bot. **4**: 50. 1917.

*Aecidium Stachytarphetae* P. Henn. Hedwigia Beibl. **38**: 71. 1899.

On *Valerianoides cayennense* (L. C. Rich.) Kuntze (*Stachytarpheta cayennensis* Vahl).

Rare in Porto Rico:—Santo Domingo, South America.

**Endophyllum Wedeliae** Whetzel. & Olive.

See *Endophyllum decoloratum* Schw.

8. **PUCCINIOSIRA** Lagerh. Ber. Deuts. Bot. Ges. **9:** 344. 1891.

Telia erumpent, the teliospores catenulate, two-celled by transverse partition, the wall nearly or quite colorless; peridium cylindrical, rupturing at apex.

1. **Pucciniosira pallidula** (Speg.) Lagerh. Tromsö Mus. Aarsb. **16:** 122. 1894.

*Coleosporium* (?) *pallidulum* Speg. Anal. Soc. Ci. Argent. **17:** 95. 1884.

On *Triumfetta Bartramia* L. (*T. rhomboidea* Jacq.).
*Triumfetta Lappula* L.
*Triumfetta semitriloba* Jacq.

Common in Porto Rico, also in St. Croix, St. Thomas, and Vieques:—Mexico, Guadeloupe, Jamaica, Trinidad, South America.

9. **BOTRYORHIZA** Whetzel & Olive, Am. Jour. Bot. **4:** 47. 1917.

Telia erumpent, pulverulent, the teliospores pedicellate, one-celled, thin-walled, without peridium, the haustoria botryose.

1. **Botryorhiza Hippocrateae** Whetzel & Olive, Am. Jour. Bot. **4:** 47. 1917.

*Uromyces Hippocrateae* Sacc. & Trott., in Sacc. Syll. Fung. **23:** 647. 1925.

On *Hippocratea volubilis* L.

Common in Porto Rico; not reported elsewhere.

Family 3. **PUCCINIACEAE** (Aecidiaceae).

Teliospores fascicled or free, the walls firm or overlaid with an outer hygroscopic layer; basidia external; the telia usually erumpent, compact or pulverulent.

**Argomyces insulanus** Arth.

See *Puccinia insulana* Arth.

**Argomyces Vernoniae** Arth.

See *Puccinia Arthuriana* H. S. Jackson.

1. **RAVENELIA** Berk. Gard. Chron. **1853:** 132. 1853.

Teliospores united into a head on a compound pedicel. Cycle of development may include pycnia, aecia (primary uredinia) and telia.

1. **Ravenelia Caesalpiniae** Arth. Bull. Torrey Club **31:** 5. 1904.

*Uromyces Caesalpiniae* Arth. Mycologia **7:** 183. 1915.

On *Caesalpinia* sp. An error in determination for *Mimosa Ceratonia*.
*Mimosa Ceratonia* L.

Known only from Porto Rico, Vieques and St. Thomas, but exceedingly common throughout this range.

2. **Ravenelia cassiaecola** Atk. Bot. Gaz. **16:** 313. 1891.

On *Chamaecrista Aeschynomene* (DC.) Greene.
*Chamaecrista Swartzii* (Wickstr.) Britton (*Chamaecrista glandulosa* Millsp.).

Rather rare in Porto Rico:—southeastern United States.

3. **Ravenelia caulicola** Arth. N. Am. Fl. **7:** 143. 1907.

On *Cracca cinerea* (L.) Morong.
Uncommon in Porto Rico. Collected only by Stevens, Seaver and Chardon:—Bahama Islands.

4. **Ravenelia Cebil** Speg. Anal. Mus. Nac. Buenos Aires **19:** 295. 1909.

On *Piptadenia peregrina* (L.) Benth.
Stevens' collection of this interesting South American tree rust is the only one recorded from Porto Rico:—South America.

5. **Ravenelia Humphreyana** P. Henn. Hedwigia **37:** 278. 1898.

*Ravenelia pulcherrima* Arth. Bot. Gaz. **39:** 395. 1905.

On *Poinciana pulcherrima* L. (*Caesalpinia pulcherrima* Sw.).
A single record of this species in Porto Rico by Stevenson (Jour. Dept. Agr. Porto Rico **2:** 175):—Mexico, Guatemala, Cuba, Jamaica.

6. **Ravenelia Indigoferae** Tranz. Hedwigia **33:** 369. 1894.

On *Indigofera suffruticosa* Mill. (*I. Anil* L.).
Common on this host wherever it occurs in Porto Rico and Vieques:—Mexico Cuba, Jamaica, Bermuda, South America.

7. **Ravenelia Ingae** (P. Henn.) Arth. N. Am. Fl. **7:** 132. 1907.

*Uredo Ingae* P. Henn. Hedwigia Beibl. **38:** 69. 1899.
*Ravenelia Whetzelii* Arth. Mycologia **9:** 64. 1917.

On *Inga laurina* (Sw.) Willd.
*Inga Inga* (L.) Britton (*Inga vera* Willd.).

*R. Whetzelii* is an aecial stage (uredinoid aecia around the pycnia). The telia of this species are not known. Common throughout Porto Rico:—eastern Mexico, South America.

8. **Ravenelia Pithecolobii** Arth. Bot. Gaz. **39:** 394. 1905.

On *Pithecellobium Unguis-cati* (L.) Mart.
One collection from Vieques, the only one recorded from this region:—southern Florida, Central Mexico, and Cuba.

9. **Ravenelia portoricensis** Arth. Bull. Torrey Club **31:** 5. 1904.

On *Isandrina emarginata* (L.) Britton & Rose (*Cassia emarginata* L.).
The only collection recorded from Porto Rico is the type specimen taken by Heller in 1902 at Ponce:—Jamaica.

10. **Ravenelia siliquae** Long, Bot. Gaz. **35:** 118. 1903.

On *Vachellia Farnesiana* (L.) W. & A. (*Acacia Farnesiana* Willd.).
Rare. Only two collections from Porto Rico, Yauco and Coamo Springs:—southern Mexico.

11. **Ravenelia Stevensii** Arth. Mycologia **7:** 178. 1915.

On *Acacia riparia* H.B.K.
Known only from Porto Rico and St. Thomas.

**Ravenelia Whetzelii** Arth.

See *Ravenelia Ingae* (P. Henn.) Arth.

**Hemileia vastatrix** Berk. & Br. Gard. Chron. **1869:** 1157. 1869.

On *Coffea arabica* L.

Once reported from Porto Rico on imported plants but afterwards entirely destroyed (see N. Am. Fl. **7:** 150. 1907).

2. **PROSPODIUM** Arth. Jour. Myc. **13:** 31. 1907.

Teliospores free, two-celled by transverse septum, the wall somewhat laminate, the pedicels refractive, usually appendaged. The uredinia usually encircled by paraphyses, urediniospores pedicellate, the walls often with a gelatinous layer.

1. **Prospodium appendiculatum** (Wint.) Arth. Jour. Myc. **13:** 31. 1907.

*Puccinia appendiculata* Wint. Flora **67:** 262. 1884.

On *Tecoma stans* (L.) H.B.K. (*Stenolobium stans* Seem.).

Rare. Porto Rico and St. Croix:—central Mexico, Cuba, Martinique, Jamaica, South America.

2. **Prospodium plagiopus** (Mont.) Arth. N. Am. Fl. **7:** 162. 1912.

*Puccinia plagiopus* Mont. Pl. Cell. Cuba 294. 1842.

On *Tabebuia pallida* Miers. (*Tecoma pentaphylla* (L.) Juss.).

Rare. Known from two localities in Porto Rico, Añasco and Rio Piedras:—the only stations outside Cuba.

3. **Prospodium tuberculatum** (Speg.) Arth. N. Am. Fl. **7:** 161. 1912.

*Uredo tuberculata* Speg. Anal. Soc. Ci. Argent. **9:** 172. 1880.
*Puccinia tuberculata* Speg. Anal. Soc. Ci. Argent. **10:** 6. 1880.

On *Lantana Camara* L.

Rare. First collected in Porto Rico by Seaver and Chardon, 1923:—central Mexico, South America.

3. **DICHEIRINIA** Arth. N. Am. Fl. **7:** 147. 1907.

Teliospores free, more than one on each pedicel, one-celled; uredinia encircled by paraphyses; urediniospores borne singly on pedicels, the wall echinulate.

1. **Dicheirinia binata** (Berk.) Arth. N. Am. Fl. **7:** 147. 1907.

*Uredo Cabreriana* Kern & Kellerm. Jour. Myc. **13:** 25. 1907.

On *Erythrina Crista-galli* L.
*Erythrina glauca* Willd.

Occurs in several localities in Porto Rico on the last named host; known only from a single tree in Experiment Station grounds Mayaguez, on the first named host:—Central America, Cuba, Trinidad.

4. **TRANZSCHELIA** Arth. Résult. Sci. Congr. Bot. Vienne 340. 1906.

Teliospores forming heads by being attached by short pedicels to a common stalk. Cycle of development includes pycnia, aecia, uredinia, and telia.

1. **Tranzschelia punctata** (Pers.) Arth. Résult. Sci. Congr. Bot. Vienne 340. 1906.

On *Amygdalus persica* L.

Known from Porto Rico from a single collection by Earle 1903 on peach leaves at Mayaguez:—Bermuda, Eastern Canada, United States, Central America, South America, Europe, southern Africa, and Australia.

5. **KUEHNEOLA** Magn. Bot. Centralbl. **74:** 169. 1898.

Telia erumpent, velvety, the teliospores one-celled, catenulate, with many spores in spreading, free chains; uredinia with paraphyses hyphoid, inconspicuous or none.

**Kuehneola Fici** (Cast.) Arth.

See *Cerotelium Fici* (Cast.) Arth.

**Kuehneola Gossypii** (Lagerh.) Arth.

See *Cerotelium desmium* (Berk. & Br.) Arth.

1. **Kuehneola malvicola** (Speg.) Arth. N. Am. Fl. **7:** 187. 1912.

*Uredo malvicola* Speg. Anal. Soc. Ci. Argent. **17:** 124. 1884.
*Uredo Hibisci* Syd. Hedwigia Beibl. **40:** 128. 1901.

On *Malache scabra* B. Vogel (*Pavonia racemosa* Sw.).
Reported from Porto Rico only on this host:—southern United States, Central America, Cuba, South America.

6. **DESMELLA** Syd. Ann. Myc. **16:** 241. 1918.

Telia without peridium or paraphyses, the teliospores two-celled, the wall colored, firm, smooth, pores one in each cell, apical or in the upper part; uredinia without peridium or paraphyses, the urediniospores borne singly on pedicels, globoid, the wall colored, echinulate, the pores one to several, equatorial or scattered. Cycle of development incompletely known, only uredinia and telia recognized, both subepidermal, forming beneath the stomata and protruding in tufts thus appearing superficial; possibly heteroecious.

1. **Desmella superficialis** (Speg.) Syd. Ann. Myc. **16:** 242. 1918.

*Caeoma superficialis* Speg. Anal. Soc. Ci. Argent. **17:** 96. 1884.
*Uredo superficialis* De-Toni in Sacc. Syll. Fung. **7:** 865. 1888.
*Uredo Gymnogrammes* P. Henn. Hedwigia **34:** 337. 1895.
*Desmella Gymnogrammes* Syd. Ann. Myc. **16:** 242. 1918.

On *Adiantum latifolium* Lam.
*Dennstaedtia rubiginosa* (Kaulf.) Moore.
*Dryopteris dentata* (Forsk.) C. Chr. (*D. mollis* Hieron).
*Dryopteris Poiteana* (Bory) Urban.
*Dryopteris subtetragona* (Link) Maxon (*D. tetragona* Urban).
*Goniopteris guadalupensis* Fée, reported in Mycologia **9:** 91, 1917, error for *Dryopteris subtetragona*.
*Pityrogramma calomelanos* (L.) Link.
*Tectaria martinicensis* (Spreng.) Copel.

Common in the high mountain regions of Porto Rico:—Cuba, Jamaica, Grenada, South America.

7. **UROMYCES** Unger. Exanth. Pfl. 277. 1833.

Teliospores free, pedicelled, one-celled, the wall colored; uredinia when present erumpent, without peridium, urediniospores borne singly on pedicels, the wall echinulate or verrucose, the pores two to several, variously arranged; aecia of the aecidioid type present in some species; heteroecious or autoecious.

1. **Uromyces affinis** Wint. Hedwigia **24:** 259. 1885.

*Uredo globulosa* Arth. Mycologia **8:** 22. 1916. (See Mycologia **14:** 14. 1922.)

On *Hypoxis decumbens* L.

The uredo stage of this rust very common wherever the host is found in Porto Rico:—local from Connecticut and Missouri southward through Mexico and the West Indies; also in South America.

2. **Uromyces Anthacanthi** H. S. Jackson; Seaver, Mycologia **16**: 47. 1924.

On *Anthacanthus spinosus* (Jacq.) Nees.

Known only from the type locality in St. Croix.

3. **Uromyces appendiculatus** (Pers.) Fries, Summa Veg. Scand. 514. 1849.

Not *U. appendiculatus* Ung. 1836.

*Uredo appendiculata* Pers. Ann. Bot. Usteri **15**: 16. 1795.
*Nigredo appendiculata* Arth. Result. Sci. Congr. Bot. Vienna 343. 1906.

On *Dolichos Lablab* L.
*Phaseolus adenanthus* G.F.W. Meyer.
*Phaseolus lathyroides* L.
*Phaseolus vulgaris* L.
*Vigna repens* (L.) Kuntze.
*Vigna vexillata* (L.) A. Rich.

Common in Porto Rico. On *Vigna repens* in Vieques:—eastern United States, Mexico, Cuba, Jamaica, Europe, Africa, Asia, Japan, Australia, and South America.

4. **Uromyces Arachidis** (Speg.) P. Henn. Hedwigia **35**: 224. 1896.

*Puccinia Arachidis* Speg. Anal. Soc. Ci. Argent. **17**: 90. 1884.
*Uredo Arachidis* Lagerh. Tromsö Mus. Aarsb. **17**: 106. 1894.
*Bullaria* (?) *Arachidis* Arth. & Mains, N. Am. Fl. **7**: 484. 1922.

On *Arachis hypogaea* L.

Two collections from Porto Rico by Stevens and one by Tucker:—Florida, Cuba, Grenada, Guadaloupe, Montserrat, South America.

5. **Uromyces bidenticola** (P. Henn.) Arth. Mycologia **9**: 71. 1917.

*Uredo Bidentis* P. Henn. Hedwigia **35**: 251. 1896.
*Uredo bidenticola* P. Henn. Hedwigia **37**: 279. 1898.
*Klebahnia Bidentis* Arth. Mycologia **7**: 196. 1915.

On *Bidens cynapiifolia* H.B.K.
*Bidens pilosa* L. (*Bidens leucantha* Willd.).
*Cosmos caudatus* H.B.K.

The most common rust in Porto Rico:—Jamaica, Canary Islands, Trinidad, Cuba, Martinique, South America, Central America.

6. **Uromyces Bidentis** Lagerh. Bull. Soc. Myc. Fr. **11**: 213. 1895.

*Uromyces densus* Arth. Mycologia **7**: 196. 1915.
*Teleutospora Bidentis* Arth. & Bisby, N. Am. Fl. **7**: 520. 1922.

On *Bidens pilosa* L. (*B. leucantha* Willd.).

Usually occurring with *U. bidenticola* on *B. pilosa*. Apparently not common in Porto Rico:—Martinique, Jamaica, South America.

**Uromyces Borreriae** P. Henn.

See *Uredo Borreriae* (P. Henn.) Kern & Whetzel.

7. **Uromyces caryophyllinus** (Schrank) Wint. in Rab. Krypt.-Fl. **1**[1]: 149. 1881.

*Lycoperdon caryophyllinum* Schrank, Baier. Fl. **2**: 668. 1789.
*Nigredo caryophyllina* Arth. N. Am. Fl. **7**: 246. 1912.

On *Dianthus* sp.

A single report from San Juan by Stevenson:—chiefly in greenhouses throughout temperate portions of North America; also in Europe and Japan.

8. **Uromyces Celosiae** Diet. & Holw.; Holw. Bot. Gaz. **31**: 326. 1901.

*Nigredo* (?) *Celosiae* Arth. N. Am. Fl. **7**: 246. 1912.

On *Iresine Celosia* L.

A single collection of this by Seaver and Chardon at Lapica is known from Porto Rico:—Mexico, Guatemala.

9. **Uromyces Cestri** Lév. Ann. Sci. Nat. III. **8**: 371. 1847.

*Aecidium Cestri* Mont. Ann. Sci. Nat. II. **3**: 356. 1835.
*Uromycopsis Cestri* Arth. Résult. Sci. Congr. Bot. Vienne 345. 1906.
*Puccíniola Cestri* Arth. N. Am. Fl. **7**: 452. 1921.

On *Cestrum laurifolium* L'Her.
*Cestrum macrophyllum* Vent.

Aecia common in Porto Rico; also reported from St. Jan; and Tortola. Telia when present occurring with aecia:—Jamaica, South America.

10. **Uromyces Cologaniae** Arth. Bot. Gaz. **39**: 387. 1905.

*Nigredo Cologaniae* Arth. N. Am. Fl. **7**: 256. 1912.

On *Teramnus uncinatus* (L.) Sw.

But two collections known from Porto Rico, one by Holway in 1911 near Cayey and one from Lapica by Seaver and Chardon in 1923:—Mexico.

11. **Uromyces columbianus** Mayor, Mem. Soc. Neuch. Sci. Nat. **5**: 467. 1913.

*Nigredo columbiana* Arth. Mycologia **7**: 194. 1915.

On *Melanthera canescens* (Kuntze) O. E. Schultz.
*Melanthera nivea* (L.) Small.

Common in Porto Rico; also found in Vieques on *M. nivea*:—Trinidad, South America, Central America.

12. **Uromyces Commelinae** (Speg.) Cooke, Trans. Roy. Soc. Edinb. **31**: 342. 1888.

*Uredo Commelinae* Speg. Anal. Soc. Ci. Argent. **9**: 172. 1880.
*Nigredo Commelinae* Arth. N. Am. Fl. **7**: 237. 1912.

On *Commelina elegans* H.B.K. Records on *C. virginica* from Porto Rico, error for *C. elegans*.

A single collection by Stevens and two by Chardon known from Porto Rico. Occurs in St. Croix and St. Thomas:—Florida and Texas, South America, Africa, Japan.

**Uromyces densus** Arth.

See *Uromyces Bidentis* Lagerh.

13. **Uromyces Dolicholi** Arth. Bull. Torrey Club **33**: 27. 1906.

*Nigredo Dolicholi* Arth. N. Am. Fl. **7**: 258. 1912.

On *Cajan Cajan* (L.) Millsp. (*Cajanus indicus* Spreng.).
*Dolicholus minimus* (L.) Medic. Due to printer's error this appears as *D. eninimus* in a number of publications.
*Dolicholus reticulatus* (Sw.) Millsp.

Very common in Porto Rico especially on *Cajan Cajan*. Also occurs in St. Thomas and Vieques:—Texas, Cuba, possibly also in South America.

14. **Uromyces dolichosporus** Diet. & Holw.; Holw. Bot. Gaz. **31**: 327. 1901.

*Uromyces Tournefortiae* P. Henn. Hedwigia **47**: 267. 1908.
*Klebahnia dolichospora* Arth. N. Am. Fl. **7**: 480. 1921.

On *Tournefortia microphylla* Bertero.
*Tournefortia scabra* Lam.

Autoecious with pycnia, uredinoid aecia and telia; distorts and etiolates young and growing organs of the host.

Collected in Porto Rico by Whetzel & Olive No. *312*. Referred by error to *Aecidium Tournefortiae* P. Henn. in Mycologia **9**: 88:—Mexico, Cuba, South America.

15. **Uromyces Eragrostidis** Tracy, Jour. Myc. **7**: 281. 1893.

*Nigredo Eragrostidis* Arth. Résult. Sci. Congr. Bot. Vienne 343. 1906.

On *Eragrostis ciliaris* (L.) Link.
*Eragrostis tephrosanthos* Schult.

Rare. Porto Rico and Vieques:—southern United States, Mexico.

16. **Uromyces gemmatus** Berk. & Curt.; Berk. Jour. Linn. Soc. **10**: 357. 1869.

*Klebahnia gemmata* Arth. N. Am. Fl. **7**: 479. 1921.

On *Jacquemontia nodiflora* (Desv.) G. Don.

Known only from the West Indies. Not uncommon in Porto Rico, St. Croix and St. Thomas:—Jamaica, Cuba.

17. **Uromyces Hedysari-paniculati** (Schw.) Farl.; Ellis, N. Am. Fungi *246*. 1879.

*Puccinia Hedysari-paniculati* Schw. Nat. Ges. Leipzig **1**: 74. 1822.
*Uredo Desmodii-tortuosi* P. Henn. Hedwigia **35**: 252. 1896.
*Nigredo Hedysari-paniculati* Arth. Résult. Sci. Congr. Bot. Vienne 343. 1906.

On *Meibomia axillaris* (Sw.) Kuntze.
*Meibomia purpurea* (Mill.) Vail (*Desmodium tortuosum* DC., *Meibomia tortuosa* Kuntze).
*Meibomia scorpiurus* (Sw.) Kuntze (*Desmodium scorpiurus* Desv.).
*Meibomia umbrosa* Britton.

Apparently not common in Porto Rico:—eastern United States, Cuba, Mexico, South America.

18. **Uromyces Hellerianus** Arth. Bull. Torrey Club **31**: 2. 1904.

*Nigredo Helleriana* Arth. N. Am. Fl. **7**: 267. 1912.

On *Cayaponia americana* (Lam.) Cogn.
*Cayaponia racemosa* (Sw.) Cogn.
*Fevillea cordifolia* L.
*Melothria guadalupensis* (Spreng.) Cogn.

Very common in Porto Rico:—Cuba, Central America.

19. **Uromyces Howei** Peck, Ann. Rep. N. Y. State Mus. **30**: 75. 1879.

*Nigredo* (?) *Howei* Arth. N. Am. Fl. **7**: 264. 1912.

On *Asclepias curassavica* L.
*Ibatia maritima* (Jacq.) Dcne. (*Ibatia muricata* Griseb.).

Very common in Porto Rico on the first host only. Known from St. Croix on *Ibatia maritima*:—southern Canada and northern United States, locally in Florida, Texas; common throughout Cuba, Mexico, Central America, and South America.

20. **Uromyces ignobilis** (Syd.) Arth. Mycologia **7**: 181. 1915.

*Uredo ignobilis* Syd. Ann. Myc. **4**: 444. 1906.

*Uromyces major* Arth. Bull. Torrey Club **38**: 377. 1911.
*Nigredo major* Arth. N. Am. Fl. **7**: 225. 1912.

On *Sporobolus indicus* (L.) R. Br.
*Sporobolus virginicus* (L.) Kunth.

Common in Porto Rico:—Mexico, India.

21. **Uromyces jamaicensis** Vesterg. Ark. Bot. Stockh. $4^{15}$: 33. 1905.

*Teleutospora jamaicensis* Arth. & Bisby, N. Am. Fl. **7**: 516. 1922.

On *Bauhinia Pauletia* Pers.

But two stations known for this rust in Porto Rico, Mayaguez and San German:—Mexico, Jamaica.

22. **Uromyces Janiphae** (Wint.) Arth. Mycologia **7**: 190. 1915.

*Uredo Janiphae* Wint. Grevillea **15**: 86. 1887.

On *Manihot Manihot* (L.) Cockerell (*Jatropha Manihot* L.).

Apparently rare in Porto Rico as but few collections are recorded:—distributed throughout tropical America; possibly occurs in the Old World.

23. **Uromyces leptodermus** Syd.; Syd. & Butler, Ann. Myc. **4**: 430. 1906.

*Nigredo leptoderma* Arth. N. Am. Fl. **7**: 224. 1912.

On *Lasiacis divaricata* (L.) Hitchc.
*Lasiacis ligulata* Hitchc. & Chase.
*Lasiacis Sloanei* (Griseb.) Hitchc.
*Lasiacis sorghoidea* (Desv.) H. & C. (*L. Swartziana* Hitchc.).
*Panicum barbinode* Trin. (*P. molle* Auct. not Swartz).
*Panicum parvifolium* Lam.

Field observations by Whetzel, Kern and Toro indicate that this is connected with *Aecidium abscedens* Arth. on *Randia aculeata* L.

Very common in Porto Rico, Mona and St. Croix:—Cuba, Jamaica, India.

24. **Uromyces Neurocarpi** Dietel, Hedwigia **34**: 292. 1895.

*Nigredo Neurocarpi* Arth. N. Am. Fl. **7**: 258. 1912.

On *Martiusia laurifolia* (Poir.) Britton (*Clitoria cajanifolia* Benth.).
*Martiusia rubiginosa* (Juss.) Britton (*Clitoria rubiginosa* Juss.).

Common in Porto Rico especially on *M. rubiginosa*:—Jamaica, Cuba, Mexico, South America.

**Uromyces Pavoniae** Arth.

See *Puccinia heterospora* Berk. & Curt.

25. **Uromyces pianhyensis** P. Henn. Hedwigia **47**: 266. 1908.

On *Wedelia reticulata* DC.

Known in the West Indies only from Porto Rico. Probably common here but rarely collected because of its inconspicuous character:—South America.

26. **Uromyces proëminens** (DC.) Pass. Rab. Fungi Eur. *1795*. 1873.

*Nigredo proëminens* Arth. N. Am. Fl. **7**: 259. 1912.

On *Chamaesyce hirta* (L.) Millsp. (*Euphorbia hirta* L., *E. pilulifera* L.).
*Chamaesyce hypericifolia* (L.) Millsp.
*Chamaesyce hyssopifolia* (L.) Small. (*Chamaesyce brasiliensis* Small, *Euphorbia brasiliensis* Lam.).
*Chamaesyce nutans* (Lag.) Small.

*Chamaesyce prostrata* (Ait.) Small.
*Chamaesyce serpens* (H.B.K.) Small.
*Poinsettia cyathophora* (Murr.) Kl. & Garcke.
*Poinsettia heterophylla* (L.) Kl. & Garcke.

A very common rust on numerous hosts in Porto Rico: also recorded from Vieques and St. Croix:—United States, Bermuda, Mexico, Central America, Jamaica, Bahamas, Cuba, South America, Europe, Asia, and Africa.

27. **Uromyces Rhyncosporae** Ellis, Jour. Myc. **7**: 274. 1893.

*Nigredo Rhyncosporae* Arth. Résult. Sci. Congr. Bot. Vienne 344. 1906.

On *Rynchospora corymbosa* (L.) Britton. The record for the rust on this host is given under the synonym *R. aurea* Vahl (Mycologia **7**: 182) but it should be referred, according to Arthur (mss. correction), to *Puccinia angustatoides*.
*Rynchospora distans* (Michx.) Vahl.
*Rynchospora micrantha* Vahl.
*Rynchospora setacea* (Berg.) Boeckl.

Common in Porto Rico:—southeastern Canada, Eastern United States, Bermuda.

28. **Uromyces Sabineae** Arth. Mycologia **9**: 69. 1917.

On *Sabinea punicea* Urban.

Known apparently only from the type locality, Maricao, Porto Rico. The host is endemic.

29. **Uromyces Salmeae** Arth. & Holw. Am. Jour. Bot. **5**: 445. 1918.

On *Salmea scandens* (L.) DC.

Two collections by Seaver and Chardon near Vega Alta and Toa Alta, Porto Rico, in 1923; these localities are the only stations known for this rust outside the type locality in Guatemala (Mycologia **16**: 48).

30. **Uromyces Scleriae** P. Henn. Hedwigia Beibl. **38**: 67. 1899.

*Nigredo Scleriae* Arth. Résult. Sci. Congr. Bot. Vienne 344. 1906.

On *Scleria canescens* Boeckl.
*Scleria pterota* Presl.

This rust sometimes occurs intermixed on the same plants with *Puccinia Scleriae*. Common on the last named host throughout Porto Rico:—Cuba, South America.

8. **PUCCINIA** Link, in Willd. Sp. Pl. **6**[2]: 67. 1825.

Teliospores free, pedicelled, two-celled, the wall colored; uredinia when present erumpent, without peridium; urediniospores borne singly on pedicels, the wall echinulate or verrucose, the pores one to several, variously arranged; aecia of the uredinoid type present in some species; heteroecious or autoecious.

1. **Puccinia aequinoctialis** Holway, Ann. Myc. **3**: 22. 1905.

On *Cydista aequinoctialis* (L.) Miers. (*Bignonia aequinoctialis* L.).

Referred by Arthur to *Puccinia cuticulosa* (Ellis & Ev.) Arth. in error (Mycologia **9**: 83. 1917).

The only record for this rust in Porto Rico is the collection by Whetzel & Olive No. *372*, near Martin Peña:—Trinidad, Cuba, South America.

2. **Puccinia angustatoides** Stone, Bull. Torrey Club **36:** 549. 1909.

*Dicaeoma angustatoides* Arth. N. Am. Fl. **7:** 351. 1920.

On *Rynchospora corymbosa* (L.) Britton (*Rynchospora aurea* Vahl). *Rynchospora cyperoides* (Sw.) Mart.

Common in Porto Rico:—southern United States, Bahamas, Trinidad.

3. **Puccinia Arechavelatae** Speg. Anal. Soc. Ci. Argent. **12:** 67. 1881.

*Micropuccinia Arechavelatae* Arth. & Jackson, N. Am. Fl. **7:** 541. 1922.

On *Cardiospermum Halicacabum* L.

*Cardiospermum microspermum.* An error in spelling for *C. microcarpum* in Mycologia **7:** 236. 1915.

*Cardiospermum microcarpum* H.B.K.

Not commonly collected in Porto Rico:—southern United States, Mexico, Central America, Cuba, St. Vincent, Trinidad, Jamaica, Antigua, Bahamas, South America.

4. **Puccinia Arthurella** Trotter in Sacc. Syll. Fung. **23:** 694. 1925.

*Uredo proximella* Arth. Mycologia **7:** 324. 1915.

*Puccinia proximella* Arth. Bull. Torrey Club **47:** 471. 1920. Not *P. proximella* Syd, Ann. Myc. **10:** 215. 1912.

*Dicaeoma proximella* Arth. N. Am. Fl. **7:** 439. 1921.

On *Brachyramphus intybaceus* (Jacq.) DC. (*Lactuca intybacea* Jacq.).

Very rare in Porto Rico. Collected by Whetzel, Kern and Toro in Vieques;—Cuba and Santo Domingo.

5. **Puccinia Arthuriana** H. S. Jackson, Bot. Gaz. **65:** 295. 1918.

*Argomyces Vernoniae* Arth. N. Am. Fl. **7:** 218. 1912.

*Bullaria Arthuriana* Arth. & Mains, N. Am. Fl. **7:** 496. 1922.

On *Vernonia albicaulis* Pers.

*Vernonia borinquensis* Urban.

*Vernonia sericea* L. C. Rich. (*V. phyllostachya* Gleason).

This species may be identical with *P. insulana* which see.

Common in Porto Rico. Reported also from St. Croix:—Costa Rica, Bahamas, Central America.

**Puccinia Blechi** Lagerh.

See *Puccinia Ruelliae* (Berk. & Br.) Lagerh.

6. **Puccinia Cameliae** (Mayor) Arth. Mycologia **7:** 227. 1915.

*Uredo Cameliae* Mayor, Mem. Soc. Neuch. Sci. **5:** 578. 1913.

*Dicaeoma Cameliae* Arth. & Fromme, N. Am. Fl. **7:** 293. 1920.

On *Chaetochloa setosa* (Sw.) Scribn. (*Panicum setosum* Sw.).

Not known from Porto Rico. Collected by Stevens on Mona Island 1913:—Texas, Jamaica, South America.

7. **Puccinia canaliculata** (Schw.) Lagerh. Tromsö Mus. Aarsb. **17:** 51. 1894.

*Sphaeria canaliculata* Schw. Trans. Am. Phil. Soc. II. **4:** 209. 1832.

*Dicaeoma canaliculatum* Kuntze, Rev. Gen. **3**[3]: 466. 1898.

On *Cyperus articulatus* L. Reported by Stevenson, Jour. Dept. Agr. Porto Rico, **2:** 167.

*Cyperus ferax* L. C. Rich.

*Cyperus giganteus* Vahl.

*Cyperus reticulatus* L. An error in determination as this species is not recorded for Porto Rico.

Other hosts reported as bearing this species in Porto Rico are now to be found under *P. Cyperi* and *P. Cyperi-tagetiformis.*

Common in Porto Rico:—southeastern Canada, eastern United States, Mexico, Central America, Jamaica, Cuba.

8. **Puccinia Cannae** (Wint.) P. Henn. Hedwigia **41:** 105. 1902.

*Uredo Cannae* Wint. Hedwigia **23:** 172. 1884.
*Puccinia Thaliae* Diet. Hedwigia **38:** 250. 1899.
*Dicaeoma* (?) *Cannae* Arth. N. Am. Fl. **7:** 380. 1920.

On *Calathea lutea* (Aubl.) G. F. W. Meyer.
*Canna coccinea* Mill.
*Canna glauca* L.
*Canna* sp. (Cult.)
*Thalia geniculata* L.

Very common on species of *Canna* throughout Porto Rico:—Central America, Cuba, Trinidad, Jamaica, Santo Domingo.

9. **Puccinia Cenchri** Diet. & Holw.; Holway, Bot. Gaz. **24:** 28. 1897.

*Dicaeoma Cenchri* Arth. Résult. Sci. Congr. Bot. Vienne 344. 1906.

On *Cenchrus carolinianus* Walt. Citation of *C. pauciflorus* Benth. (N. Am. Fl. **7:** 294) apparently an error; does not occur in Porto Rico.
*Cenchrus echinatus* L.
*Cenchrus viridis* Spreng.

Very common in Porto Rico on *C. echinatus;* also found in Mona, Vieques and St. Croix:—southern United States, Central America, Bahamas, Cuba, Jamaica.

10. **Puccinia Chaetochloae** Arth. Bull. Torrey Club **34:** 585. 1907.

*Uredo Chaetochloae* Arth. Bull. Torrey Club **33:** 518. 1906.
*Dicaeoma Chaetochloae* Arth. & Fromme, N. Am. Fl. **7:** 288. 1920.

On *Paspalum glabrum* Poir. (*P. Helleri* Nash).
*Paspalum orbiculatum* Poir.
*Paspalum secans* Hitchc. & Chase.

This rust on these hosts formerly referred to *P. substriata.* Rare in Porto Rico:—southern Florida, Cuba, and Jamaica.

11. **Puccinia Cladii** Ellis & Tracy; Ellis & Ev. Bull. Torrey Club **22:** 61. 1895.

*Dicaeoma Cladii* Arth. Résult. Sci. Congr. Bot. Vienne 344. 1906.

On *Mariscus jamaicensis* (Crantz) Britton (*Cladium effusum* Torr.).

Known in Porto Rico from a single station Martin Peña:—southeastern United States, Bermuda.

12. **Puccinia concrescens** Ellis & Ev.; Arth. Mycologia **7:** 240. 1915.

*Micropuccinia concrescens* Arth. & Jackson; Arth. Bull. Torrey Club **48:** 40. 1921.

On *Asclepias curassavica* L.
*Asclepias nivea* L

A short cycle rust common in Porto Rico: sometimes occurring intermixed with *U. Howei:*—Bermuda, Cuba, Bahamas, and South America.

13. **Puccinia Conoclinii** Seym.; Burrill, Bot. Gaz. **9:** 191. 1884.

*Puccinia rosea* Arth. Bot. Gaz. **40:** 206. 1905 (in part).
*Bullaria* (?) *Conoclinii* Arth. & Mains, N. Am. Fl. **7:** 500. 1922.

On *Ageratum conyzoides* L.
*Critonia portoricensis* (Urban) Britton (*Eupatorium portoricensis* Urban).
*Osmia geraniifolia* (Urban) Britton & Wilson (*Eupatorium geraniifolium* Urban).
*Eupatorium polyodon* Urban.

Apparently not common in Porto Rico:—United States, Mexico, Central America, Cuba, South America, Hawaii.

14. **Puccinia consobrina** Arth. & Holw.; Arth. Mycologia **10:** 129. 1918.

*Dicaeoma consobrinum* Arth. N. Am. Fl. **7:** 352. 1920.

On *Rynchospora corymbosa* (L.) Britton.
A single collection of this rust, by Seaver and Chardon, is known from Porto Rico:—Central America, Jamaica.

15. **Puccinia Cordiae** (P. Henn.) Arth. Mycologia **8:** 17. 1916.

*Uredo Cordiae* P. Henn. Hedwigia **43:** 163. 1904.
*Bullaria Cordiae* Arth. & Mains, N. Am. Fl. **7:** 492. 1922.

On *Cerdana alliodora* R. & P. (*Cordia alliodora* Cham., *Gerascanthus*).
Not uncommon in Porto Rico:—Guatemala.

16. **Puccinia crassipes** Berk. & Curt. Grevillea **3:** 54. 1874.

*Allodus crassipes* Arth. Résult. Sci. Congr. Bot. Vienne 345. 1906.

On *Ipomoea triloba* L.
Rare in Porto Rico. Recorded also from Mona, St. Thomas, and St. Croix:—southern United States, Mexico, Central America, Cuba, South America.

**Puccinia cuticulosa** (Ellis & Ev.) Arth.

See *Puccinia aequinoctialis* Holw.

17. **Puccinia Cynodontis** Lacroix in Desmaz. Pl. Crypt. II. 655. 1859.

*Dicaeoma Cynodontis* Kuntze, Rev. Gen. **3**[3]: 468. 1898.

On *Capriola Dactylon* (L.) Kuntze (*Cynodon Dactylon* Pers.).
Aecidium on *Plantago* spp. in Europe and Japan, not yet found in America.
Apparently not common in Porto Rico:—southern United States, Central America, Europe, Asia, Africa, and Japan.

18. **Puccinia Cyperi** Arth. Bot. Gaz. **16:** 226. 1891.

*Dicaeoma Cyperi* Kuntze, Rev. Gen. **3**[3]: 466. 1898.

On *Cyperus cayennensis* (Lam.) Britton.
*Kyllinga brevifolia* Rottb.
*Kyllinga pumila* Michx.

Collections of this species in Porto Rico heretofore referred to *P. canaliculata.*
Apparently common in Porto Rico:—eastern United States, Mexico, Central America.

19. **Puccinia Cyperi-tagetiformis** (P. Henn.) Kern, Mycologia **11:** 138. 1919.

*Uredo Cyperi-tagetiformis* P. Henn. Bot. Jahrb. **34:** 598. 1905.
*Dicaeoma Cyperi-tagetiformis* Arth. N. Am. Fl. **7:** 346. 1920.

On *Cyperus brunneus* Sw.
*Cyperus distans* L. f.
*Cyperus laevigatus* L.
*Cyperus odoratus* L.

*Cyperus radiatus* Vahl.
*Cyperus sphacelatus* Rottb.
*Cyperus surinamensis* Rottb.

Collections of this species in Porto Rico heretofore referred to *P. canaliculata.*

Common in Porto Rico; also found in Vieques:—Texas, Japan, India, and the Philippine Islands.

20. **Puccinia deformata** Berk. & Curt.; Berk. Jour. Linn. Soc. **10**: 357. 1869.

*Dicaeoma deformatum* Kuntze, Rev. Gen. **3**[3]: 468. 1898.

On *Olyra latifolia* L.

Recorded in two collections by Stevens and one by Heller from Porto Rico (Mycologia **7**: 229):—Nicaragua, Cuba, Jamaica, Trinidad, South America.

21. **Puccinia Eleocharidis** Arth. Bull. Iowa Agr. Coll. Dept. Bot. **1884**: 156. 1884.

*Dicaeoma Eleocharidis* Kuntze, Rev. Gen. **3**[3]: 468. 1898.

On *Eleocharis capitata* (L.) R. Br. Error for *E. caribaea.*
*Eleocharis caribaea* (Rottb.) Blake
*Eleocharis cellulosa* Torr. The rust on this host is *Puccinia liberta* Kern.
*Eleocharis flaccida* (Reichenb.) Urban. The rust on this host is *Puccinia liberta* Kern.
*Eleocharis geniculata* (L.) R. & S. The rust on this host is *Puccinia liberta* Kern.
*Eleocharis interstincta* (Vahl) R. & S. The rust on this host is *Uredo incomposita* Kern.
*Eleocharis mutata* (L.) R. & S. The rust on this host is *Puccinia liberta* Kern.

Aecidium on *Eupatorium* spp. in the United States, not yet collected in Porto Rico. Uredo stage only.

Apparently rare in Porto Rico:—southern Canada, central and eastern United States, Cuba, Central America.

22. **Puccinia Emiliae** P. Henn. Hedwigia **37**: 278. 1898.

*Micropuccinia Emiliae* Arth. & Jackson, N. Am. Fl. **7**: 584. 1922.

On *Emilia sonchifolia* (L.) DC.
*Neurolaena lobata* (L.) R. Br.

Collections of this species heretofore have been referred to *Puccinia Synedrellae.*

Common in Porto Rico especially on *E. sonchifolia.* Also found in St. Croix and Antigua:—central United States and Florida, Central America, Cuba, Grenada, Jamaica, Martinique, Barbados, Trinidad.

23. **Puccinia eslavensis** Diet. & Holw.; Holway, Bot. Gaz. **24**: 29. 1897.

*Dicaeoma eslavense* Arth. Résult. Sci. Congr. Bot. Vienne 344. 1906.

On *Valota insularis* (L.) Chase.

This species has only recently been recognized from Porto Rico on this host. It appears to be largely confined to the mountain sections while *P. substriata* occurs on *Valota insularis* in the lowlands. Recorded also from St. Thomas:—southern United States, Central America.

**Puccinia Euphorbiae** P. Henn.

This species does not occur in this region. Specimens previously recorded under this name are now to be referred to *Puccinia velata* (Ellis & Ev.) Arth.

24. **Puccinia fallaciosa** Arth. Mycologia **9**: 84. 1917.

*Uredo fallaciosa* Arth. Mycologia **7**: 323. 1915.

On *Palicourea crocea* (Sw.) R. & S.
*Palicourea riparia* Benth.
*Psychotria patens* Sw.

A very inconspicuous rust. Probably common. Known only from Porto Rico.

**Puccinia farinacea** Long.

Specimens previously recorded under this name in this region are now to be referred to *Puccinia impedita* Mains & Holway. *P. farinacea* does not occur in this flora.

25. **Puccinia Fimbristylidis** Arth. Bull. Torrey Club **33**: 28. 1906.

*Dicaeoma Fimbristylidis* Arth. N. Am. Fl. **7**: 350. 1920.

On *Fimbristylis diphylla* (Retz.) Vahl.
*Fimbristylis miliacea* (L.) Vahl. Reported by Stevenson; specimens not examined.

Collections on *Fimbristylis spadicea* and *F. ferruginea* heretofore referred to this species belong under *Uredo superior* Arth.
Common in Porto Rico:—Texas, Mexico, Martinique.

26. **Puccinia** (?) **fuirenicola** Arth. Bull. Torrey Club **46**: 109. 1919. Not *P. Fuirenae* Cooke, 1878.

*Uredo Fuirenae* P. Henn. Hedwigia Beibl. **38**: 70. 1899.
*Dicaeoma fuirenicola* Arth. N. Am. Fl. **7**: 349. 1920.

On *Fuirena umbellata* Rottb.
Common in Porto Rico:—Cuba, South America, and India.

27. **Puccinia Gouaniae** Holw. Ann. Myc. **3**: 21. 1905.

*Bullaria Gouaniae* Arth. Mycologia **9**: 80. 1917.

On *Gouania lupuloides* (L.) Urban.
*Gouania polygama* (Jacq.) Urban.

Not to be confused with *P. invaginata* Arth. & Johnson (*Uredo Gouaniae* Ellis & Kelsey) on the same hosts.
Very common in Porto Rico. Reported also from St. Croix:—Central America, Cuba, Santo Domingo, Trinidad.

28. **Puccinia Heliconiae** (Diet.) Arth. Bull. Torrey Club **45**: 144. 1918.

*Uredo Heliconiae* Diet. Hedwigia **36**: 35. 1897.

On *Bihai Bihai* (L.) Griggs (*Bihai borinquena* Griggs).
Common where the host occurs in Porto Rico:—Panama, Martinique, Trinidad, South America.

29. **Puccinia heterospora** Berk. & Curt.; Berk. Jour. Linn. Soc. **10**: 356. 1869.

*Uromyces Pavoniae* Arth. Bull. Torrey Club **31**: 1. 1904.
*Micropuccinia heterospora* Arth. & Jackson; Arth. Bull. Torrey Club **48**: 41. 1921.

On *Abutilon hirtum* (Lam.) Sweet.
*Abutilon indicum* (L.) Sweet.
*Abutilon umbellatum* (L.) Sweet.
*Malache scabra* B. Vogel (*Pavonia racemosa* Sw., *P. spicata* Cav.).
*Sida cordifolia* L.

*Sida glutinosa* Comm.
*Sida hederaefolia* Cav. Probably *S. humilis*, Botany, Porto Rico and Virgin Islands **5**: 553.
*Sida humilis* Cav.
*Sida procumbens* Sw.
*Sida spinosa* L.
*Sida urens* L.
*Wissadula amplissima* (L.) R. E. Fries.
*Wissadula periplocifolia* (L.) Presl.

Very common in Porto Rico; found also in Vieques, St. Thomas and St. Croix:—United States, Mexico, Central America, Cuba, Trinidad, Jamaica, Santo Domingo, South America, Asia, Africa, Hawaii, and the Philippines.

**Puccinia Huberi** P. Henn.

See *Puccinia levis* (Sacc. & Bizz.) Magn.

The rust on *Paspalum virgatum* heretofore generally referred to *P. Huberi* belongs under *P. substriata* Ellis and Barth. For reduction of *P. Huberi* to synonym of *P. levis*, see Arthur, Proc. Am. Phil. Soc. **64**: 176. 1925.

30 **Puccinia Hydrocotyles** (Link) Cooke, Grevillea **9**: 14. 1880.

*Caeoma Hydrocotyles* Link in Willd. Sp. Pl. **6**[2]: 22. 1825.
*Bullaria Hydrocotyles* Arth. & Mains, N. Am. Fl. **7**: 489. 1922.
On *Hydrocotyle umbellata* L. Recorded by Stevenson on *Hydrocotyle australis* Coult. & Rose. Specimens not seen. Apparently an error as this host is not recorded from Porto Rico by Britton and Wilson.

Common in Porto Rico wherever the host occurs:—Maryland, Texas, California, Mexico, Central America, Trinidad, Bermuda, Hawaii, New Zealand, South America, Europe.

31. **Puccinia Hyptidis** (Curt.) Tracy & Earle, Bull. Miss. Agr. Exp. Sta. 34: 86. 1895.

*Uredo Hyptidis* Curt. Am. Jour. Sci. II. **6**: 353. 1848.
*Dicaeoma Hyptidis* Arth. N. Am. Fl. **7**: 408. 1921.

On *Hyptis capitata* Jacq. (*Mesosphaerum capitatum* Kuntze).

Found everywhere in Porto Rico; also in Vieques and St. Thomas:—southeastern United States, Cuba, Jamaica, Trinidad.

32. **Puccinia impedita** Mains & Holw.; Arth. Mycologia **10**: 135. 1918.

*Bullaria impedita* Arth. & Mains, N. Am. Fl. **7**: 493. 1922.

On *Salvia coccinea* Juss.
*Salvia occidentalis* Sw.

The specimens on *S. coccinea* have been generally referred erroneously to *Puccinia farinacea* Long; and those on *S. occidentalis* to *P. salviicola* Diet. & Holw. (see Mycologia **7**: 249, 1915; **8**: 24, 1916; **9**: 83, 1917).

Very common on both these hosts in Porto Rico; also known from St. Thomas, St. Croix and Vieques:—Mexico, Jamaica, Cuba, Trinidad, Central America, South America.

33. **Puccinia inclita** Arth. Bull. Torrey Club **46**: 115. 1919.

*Dicaeoma inclitum* Arth. & Fromme, N. Am. Fl. **7**: 289. 1920.

On *Ichnanthus pallens* (Sw.) Munro.
*Oplismenus hirtellus* (L.) Beauv.

Specimens on *Ichnanthus pallens* in this region have been heretofore generally referred to *Puccinia substriata;* on *Oplismenus hirtellus* to *Uredo Olyrae* P. Henn. in error (Mycologia **8**: 21. 1916).

Known only from Porto Rico.

34. **Puccinia inflata** Arth. Bull. Torrey Club **33**: 516. 1906.

*Bullaria inflata* Arth. & Mains, N. Am. Fl. **7**: 486. 1922.

On *Stigmaphyllon lingulatum* (Poir.) Small.

A very common and conspicuous rust in Porto Rico; also in Vieques and Mona:—Cuba.

35. **Puccinia insititia** Arth. Mycologia **7**: 248. 1915.

*Dicaeoma insititium* Arth. N. Am. Fl. **7**: 409. 1921.

On *Hyptis lantanifolia* Poit. (*Mesosphaerum lantanifolium* Kuntze).

Rare in Porto Rico:—Cuba, Brazil.

36. **Puccinia insulana** (Arth.) H. S. Jackson, Bot. Gaz. **65**: 296. 1918.

*Argomyces insulanus* Arth. Mycologia **7**: 179. 1915.
*Bullaria insulana* Arth. & Mains, N. Am. Fl. **7**: 496. 1922.

On *Vernonia albicaulis* Pers. Seems doubtfully to belong here, but rather under *P. Arthuriana*. If so *P. insulana* would go into synonomy (according to Arthur, mss. correction).

Apparently rare in Porto Rico; reported also from St. Croix and Antigua:—Guatemala, Jamaica.

37. **Puccinia invaginata** Arth. & Johnston, Mem. Torrey Club **17**: 146. 1918.

*Uredo Gouaniae* Ellis & Kelsey, Bull. Torrey Club **24**: 209. 1897.
*Bullaria invaginata* Arth. & Mains, N. Am. Fl. **7**: 488. 1922.

On *Gouania lupuloides* (L.) Urban (*G. domingensis* L.).
*Gouania polygama* (Jacq.) Urban.

Not to be confused with *P. Gouaniae* Holway on the same hosts. Not common in Porto Rico. Recorded from St. Thomas and St. Croix:—Guatemala, Cuba, Trinidad, Central America, South America.

38. **Puccinia Kaernbachii** (P. Henn.) Arth. Bull. Torrey Club **46**: 110. 1919.

*Uredo Kaernbachii* P. Henn. Bot. Jahrb. **18**: Beibl. 44: 23. 1894.
*Uredo venustula* Arth. Mycologia **8**: 21. 1916.
*Puccinia venustula* Arth. Mycologia **10**: 128. 1918.
*Dicaeoma Kaernbachii* Arth. & Fromme, N. Am. Fl. **7**: 283. 1920.

On *Schizachyrium brevifolium* (Sw.) Nees, (*Andropogon brevifolius* Sw.).

But two collections known from Porto Rico:—Florida, Mexico, Central America, New Britain Islands.

39. **Puccinia Lantanae** Farl. Proc. Am. Acad. **18**: 83. 1883.

*Micropuccinia Lantanae* Arth. & Jackson; Arth. Bull. Torrey Club **48**: 41. 1921.

On *Lantana aculeata* L.
*Lantana Camara* L.
*Lantana involucrata* L. (*L. odorata* L.).

Several records from Porto Rico; also in Vieques, St. Thomas and Mona:—Florida, Mexico, Central America, Cuba, Jamaica, Haiti, Bermuda, Trinidad.

40. **Puccinia laterita** Berk. & Curt. Jour. Phila. Acad. Sci. **2**: 281. 1853.

*Micropuccinia lateritia* Arth. & Jackson; Arth. Bull. Torrey Club **48**: 41. 1921.

On *Borreria laevis* (Lam.) Griseb.
*Borreria verticillata* (L.) G. F. W. Meyer.
*Diodia littoralis* Sw. Error for *Ernodea littoralis* Sw.
*Diodia maritima* Thonn.

*Diodia rigida* C. & S.
*Ernodea littoralis* Sw.
*Mitracarpus portoricensis* Urban.
*Spermacoce riparia* C. & S.
*Spermacoce tenuior* L.

Very common in Porto Rico. Recorded also from St. Croix, Vieques, and Mona:—southern United States, Mexico, Central America, Jamaica, Cuba, Haiti, Bahamas, South America.

41. **Puccinia Leonotidis** (P. Henn.) Arth. Mycologia **7**: 245. 1915.
*Uredo Leonotidis* P. Henn. in Engler, Pfl. Ost.-Afr. **C**: 52. 1895.
*Dicaeoma Leonotidis* Arth. N. Am. Fl. **7**: 407. 1921.

On *Leonotis nepetaefolia* (L.) R. Br.

Very common in Porto Rico; found also in Vieques, St. Thomas and St. Croix: —Cuba, Bahamas, Jamaica, Trinidad, Santo Domingo, South America, Africa.

42. **Puccinia levis** (Sacc. & Bizz.) Magn. Ber. Deuts. Bot. Ges. **9**: 190. 1891.
See note under *P. Huberi*.

*Diorchidium leve* Sacc. & Bizz.; Sacc. Michelia **2**: 648. 1882.
*Puccinia Huberi* P. Henn. Hedwigia Beibl. **39**: 76. 1900.
*Puccinia Puttemansii* P. Henn. Hedwigia **41**: 105. 1902.
*Dicaeoma leve* Arth. & Fromme, N. Am. Fl. **7**: 286. 1920.
On *Panicum adspersum* Trin.
*Panicum fasciculatum* Sw.
*Panicum maximum* Jacq.
*Panicum trichoides* Sw.
*Panicum utowanaeum* Scribn.
*Paspalum fimbriatum* H.B.K.
*Paspalum millegrana* Schrad.
*Paspalum plicatulum* Michx.
*Rytilix granularis* (L.) Skeels.

Not uncommon in Porto Rico, also recorded from Mona, St. Croix and Antigua:—southern United States, Mexico, Cuba, Central America, Guadeloupe, Martinique, northern South America.

43. **Puccinia liberta** Kern, Mycologia **11**: 142. 1919.
*Dicaeoma libertum* Arth. N. Am. Fl. **7**: 348. 1920.

On *Eleocharis cellulosa* Torr. Previously recorded under *Puccinia Eleocharidis*.
*Eleocharis flaccida* (Reichenb.) Urban.
*Eleocharis geniculata* (L.) R. & S. Previously recorded under *Puccinia Eleocharidis*.
*Eleocharis mutata* (L.) R. & S. Previously recorded under *Puccinia Eleocharidis*.

Common in Porto Rico:—southern California, Central America.

44. **Puccinia Lithospermi** Ellis & Kellerm. Jour. Myc. **1**: 2. 1885.
*Dicaeoma Lithospermi* Kuntze, Rev. Gen. **3**$^{3}$: 469. 1898.

On *Evolvulus nummularius* L.

Evidently rare in Porto Rico:—United States, Japan.

45. **Puccinia medellinensis** Mayor, Mem. Soc. Neuch. Sci. Nat. **5**: 497. 1913.
*Dicaeoma medellinense* Arth. N. Am. Fl. **7**: 408. 1921.

On *Hyptis pectinata* (L.) Poit. (*Mesosphaerum pectinatum* Poit.).
*Hyptis suaveolens* (L.) Poit. (*Mesosphaerum suaveolens* Kuntze).

Common in Porto Rico:—Central America, Cuba, Jamaica, South America.

46. **Puccinia Melampodii** Diet. & Holw.; Holw. Bot. Gaz. **24:** 32. 1897.

*Puccinia Synedrellae* P. Henn. Hedwigia **37:** 277. 1898.
*Micropuccinia Melampodii* Arth. & Jackson, N. Am. Fl. **7:** 581. 1922.

On *Eleutheranthera ruderalis* (Sw.) Sch.-Bip.
*Emilia sonchifolia* (L.) DC. The rust on this host is *Puccinia Emiliae* P. Henn.
*Neurolaena lobata* (L.) R. Br. The rust on this host is *Puccinia Emiliae* P. Henn.
*Synedrella nodiflora* (L.) Gaertn.

Very common in Porto Rico. Also recorded from Tortola, St. Thomas, St. Croix and Vieques:—Texas, Mexico, Cuba, Jamaica, Santo Domingo, Martinique, Haiti, Barbados, Grenada.

47. **Puccinia obliqua** Berk. & Curt.; Berk. Jour. Linn. Soc. **10:** 356. 1869.

*Micropuccinia obliqua* Arth. & Jackson; Arth. Bull. Torrey Club **48:** 42. 1921.

On *Metastelma lineare* Bello.
*Metastelma parviflorum* R. Br.

Rather rare in Porto Rico. Reported from St. Croix and St. Thomas:—southern United States, Mexico, Central America, Isle of Pines, Cuba, Martinique, Bahamas, Trinidad, Jamaica, South America.

48. **Puccinia offuscata** Arth. Bull. Torrey Club **47:** 469. 1920. Not *P. Zorniae* McAlpine. 1906.

*Uredo Zorniae* Diet. Hedwigia **38:** 257. 1899.
*Bullaria* (?) *Zorniae* Arth. Bull. Torrey Club **49:** 190. 1922.

On *Zornia diphylla* (L.) Pers.
Rare in Porto Rico:—Florida, Cuba, South America.

49. **Puccinia opulenta** Speg. Anal. Soc. Ci. Argent. **9:** 170. 1880.

*Allodus opulenta* Orton, Mem. N. Y. Bot. Gard. **6:** 195. 1916.

On *Exogonium arenarium* Choisy (*Ipomoea arenaria* Steud.).
Known in St. Thomas from a single collection by J. N. Rose (Mycologia **16:** 11):—South America.

50. **Puccinia Ormosiae** Arth. Mycologia **9:** 78. 1917.

*Dicaeoma Ormosiae* Arth. N. Am. Fl. **7:** 391. 1920.

On *Ormosia Krugii* Urban.
Known only from Porto Rico in the collections of Whetzel and Olive.

51. **Puccinia pallescens** Arth. Bull. Torrey Club **46:** 111. 1919. Not *Puccinia pallida* Tracy, 1893.

*Uredo pallida* Diet. & Holw. Bot. Gaz. **24:** 37. 1897.
*Dicaeoma pallescens* Arth. & Fromme, N. Am. Fl. **7:** 278. 1920.

On *Zea Mays* L.
Probably common in Porto Rico (see Stevenson Jour. Dept. Agr. Porto Rico **2:** 181):—in Mexico and Central America on species of *Tripsacum* where teliospores have been found (see Bull. Torrey Club **46:** 111–112. 1919).

52. **Puccinia phakopsoroides** Arth. & Mains, Bull. Torrey Club **46:** 412. 1919.

*Dicaeoma phakopsoroides* Arth. & Fromme, N. Am. Fl. **7:** 295. 1920.

On *Olyra latifolia* L.
Known in Porto Rico by three collections by Stevens and one by Heller:—Cuba.

53. **Puccinia Plucheae** (Syd.) Arth. Bull. Torrey Club **49**: 194. 1922.

*Uredo Plucheae* Syd. Ann. Myc. **1**: 333. 1903.
*Uredo biocellata* Arth. Bull. Torrey Club **33**: 517. 1906.

On *Pluchea odorata* (L.) Cass.
*Pluchea purpurascens* (Sw.) DC.

Uncommon in Porto Rico; also reported by Stevens from Mona:—Florida, Guatemala, Santo Domingo, South America.

54. **Puccinia Polygoni-amphibii** Pers. Syn. Fung. 227. 1801.

*Dicaeoma Polygoni-amphibii* Arth. Proc. Ind. Acad. Sci. **1898**: 184. 1899.

On *Persicaria portoricensis* (Bert.) Small (*Polygonum portoricense* Bert.).
*Persicaria punctata* (Ell.) Small (*Polygonum punctatum* Ell., *Polygonum acre* H.B.K.).

The aecia which occur on *Geranium* spp., are not known from Porto Rico.
Very common in Porto Rico along streams:—throughout North America; also in Cuba, South America, Central America, Europe, Africa, India, China and Japan.

**Puccinia proximella** Arth.

See *Puccinia Arthurella* Trotter.

55. **Puccinia Psidii** Wint. Hedwigia **23**: 171. 1884.

*Bullaria* (?) *Psidii* Arth. & Mains, N. Am. Fl. **7**: 488. 1922.

On *Jambos Jambos* (L.) Millsp. (*Eugenia Jambos* L., *J. vulgaris* DC.).
*Psidium Guajava* L.

Exceedingly common in Porto Rico on *J. Jambos*:—Cuba, South America.

56. **Puccinia purpurea** Cooke, Grevillea **5**: 15. 1876.

*Dicaeoma purpureum* Kuntze, Rev. Gen. **3**[3]: 470. 1898.

On *Holcus Sorghum* L.
*Holcus halepensis* L.

Rare in Porto Rico:—southern United States, Central America, Cuba, Trinidad, Jamaica, Bermuda, South America, Europe, Asia, Northern Africa, Hawaii.

**Puccinia Raunkaerii** Ferd. & Winge.

See *Puccinia Rivinae* (Berk. & Curt.) Speg.

57. **Puccinia Rivinae** (Berk. & Curt.) Speg. Anal. Mus. Nac. Buenos Aires **19**: 304. 1909.

*Aecidium Rivinae* Berk. & Curt.; Berk. Jour. Linn. Soc. **10**: 358. 1869.
*Endophyllum Rivinae* Arth. N. Am. Fl. **7**: 126. 1907.
*Puccinia Raunkaerii* Ferd. & Winge, Bot. Tidsskr. **29**: 8. 1908.
*Dicaeoma Rivinae* Arth. N. Am. Fl. **7**: 388. 1920.

On *Rivina humilis* L.
*Trichostigma octandrum* (L.) H. Walt. (*Rivina octrandra* L.).

Aecia forming large galls on stems of both hosts, but especially on *T. octandrum*.
Common on *T. octandrum* in Porto Rico. Recorded from St. Thomas:—Cuba, South America.

**Puccinia rosea** (Diet. & Holw.) Arth.

See *Puccinia Conoclinii* Seym.

58. **Puccinia Ruelliae** (Berk. & Br.) Lagerh. Tromsö Mus. Aarsb. **17**: 71. 1895.

*Uredo Ruelliae* Berk. & Br. Jour. Linn. Soc. **14**: 92. 1873.
*Puccinia Blechi* Lagerh.; Pat. & Lagerh. Bull. Soc. Myc. Fr. **11**: 214. 1895.
*Dicaeoma Ruelliae* Kuntze, Rev. Gen. **3**[3]: 470. 1898.

On *Blechum Blechum* (L.) Millsp. (*Blechum Brownei* Juss.).
*Stethoma pectoralis* (Jacq.) Raf. (*Dianthera pectoralis* Gmel.).

Common in Porto Rico, St. Croix, St. Thomas and Vieques:—southeastern United States, Central America, Cuba, Martinique, Trinidad, Jamaica, Guatemala.

**Puccinia salviicola** Diet. & Holw.

See *Puccinia impedita* Mains & Holw.

59. **Puccinia Scirpi** DC. Fl. Fr. **2**: 223. 1805.

*Dicaeoma Scirpi* S. F. Gray, Nat. Arr. Brit. Pl. **1**: 542. 1821.

On *Scirpus validus* Vahl (*Scirpus lacustris* Bert. not L.).

Aecia on *Nymphoides Grayanum* (Griseb.) Arth. (*Limnanthemum Grayanum* Griseb.) in Cuba (see N. Am. Fl. **7**: 342), not known from Porto Rico.

Known in Porto Rico from a single collection on *Scirpus* by Heller at Guanica 1902:—Cuba, Bermuda, Europe.

60. **Puccinia Scleriae** (Paz.) Arth. Mycologia **9**: 75. 1917.

*Rostrupia Scleriae* Paz. Hedwigia **31**: 96. 1892.
*Aecidium passifloriicola* P. Henn. Hedwigia **43**: 168. 1904.
*Dicaeoma Scleriae* Arth. N. Am. Fl. **7**: 349. 1920.

On *Passiflora rubra* L.
*Scleria cubensis* Boeckl.
*Scleria pterota* Presl.

Aecia on *Passiflora rubra* L., recorded from Mayaguez during March and April. Uredinia and telia common on *Scleria* in Porto Rico. Recorded on *S. pterota* from St. Thomas:—Panama, South America, Trinidad.

61. **Puccinia scleriicola** Arth. Mycologia **7**: 232. 1915.

*Dicaeoma scleriicola* Arth. N. Am. Fl. **7**: 350. 1920.

On *Scleria hirtella* Sw. The rust collections on this host from Porto Rico are doubtfully referred to this species (Mycologia **9**: 97); may belong to *Puccinia Scleriae*.
*Scleria* sp.

Apparently rare in Porto Rico:—southeastern United States, Cuba.

62. **Puccinia Smilacis** Schw. Schr. Nat. Ges. Leipzig **1**: 72. 1822.

*Dicaeoma Smilacis* Kuntze, Rev. Gen. **3**[3]: 470. 1898.

On *Smilax domingensis* Willd.

Known from but two stations in Porto Rico:—eastern United States, Mexico, Cuba, Jamaica, Trinidad.

63. **Puccinia Sorghi** Schw. Trans. Am. Phil. Soc. II. **4**: 295. 1832.

*Aecidium oxalidis* Thüm. Flora **59**: 425. 1876.

On *Zea Mays* L.

A collection by Clinton, 1904, *130*, and one by C. M. Tucker, 1923, *286*, only, are known from Porto Rico. Common in United States and Canada. Known also from Mexico, Central America, Cuba, South America, Europe, and Africa.

64. **Puccinia Spegazzinii** De-Toni, in Sacc. Syll. Fung. **7**: 704. 1888.

*Puccinia Melothriae* Stevens, Bot. Gaz. **43**: 283. 1907.
*Micropuccinia Spegazzinii* Arth. & Jackson; Arth. Bull. Torrey Club **48**: 41. 1921.

On *Mikania congesta* DC. (*Mikania scandens* of authors, not Willd.).

Rare in Porto Rico; known from a single collection at Mayaguez by Whetzel and Olive:—southern United States, Central America, South America, Cuba, Martinique, Trinidad.

65. **Puccinia striolata** Speg. Anal. Soc. Ci. Argent. **10**: 8. 1880.

*Uredo striolata* Speg. Anal. Soc. Ci. Argent. **9**: 173. 1880.
*Puccinia macropoda* (Speg.) Arth. Mem. Torrey Club **17**: 142. 1918.
*Dicaeoma striolatum* Arth. N. Am. Fl. **7**: 387. 1920.

On *Iresine angustifolia* Euph. (*I. elatior* Rich.).

Rare in Porto Rico. Reported from St. Thomas:—Cuba, Trinidad, South America.

66. **Puccinia substriata** Ellis & Barth. Erythea **5**: 47. 1897.

*Dicaeoma substriatum* Arth. Result. Sci. Congr. Bot. Vienne 344. 1906.

On *Chaetochloa geniculata* (Lam.) Millsp. & Chase (*C. imberbis* Scribn.).
*Eriochloa subglabra* (Nash) Hitchc.
*Ichnanthus pallens* (Sw.) Munro (*Panicum pallens* Sw.). Previous records on this host are to be referred to *P. inclita* Arth.
*Paspalum glabrum* Poir. (*Paspalum Helleri* Nash). Previous records on this host now referred to *Puccinia Chaetochloae* Arth.
*Paspalum orbiculatum* Poit. Previous records on this host now referred to *Puccinia Chaetochloae* Arth.
*Paspalum portoricense* Nash. Reported by Stevenson, Jour. Dept. Agr. Porto Rico **2**: 173.
*Paspalum virgatum* L. The rust on this host has usually heretofore been referred to *P. Huberi* under which see note.
*Syntherisma digitata* (Sw.) Hitchc. Previous records on this host to be referred to *P. tubulosa* (Pat. & Gaill.) Arth.
*Valota insularis* (L.) Chase. Previous records on this host to be referred to *P. tubulosa* (Pat. & Gaill.) Arth.

Inconspicuous; probably common in Porto Rico; also in Vieques:—southeastern United States, Central America, Cuba, Jamaica, Trinidad.

**Puccinia Synedrellae** P. Henn.

See *Puccinia Melampodii* Diet. & Holw.

67. **Puccinia tageticola** Diet. & Holw.; Holway, Bot. Gaz. **24**: 26. 1897.

On *Tagetes erecta* L.
*Tagetes patula* L. (*T. tenuifolia* H.B.K.).

Occasionally in Gardens in Porto Rico:—Mexico, Central America, South America.

68. **Puccinia tubulosa** (Pat. & Gaill.) Arth. Am. Jour. Bot. **5**: 464. 1918.

*Aecidium tubulosum* Pat. & Gaill. Bull. Soc. Myc. Fr. **4**: 97. 1888.
*Uredo paspalicola* P. Henn. Hedwigia **44**: 57. 1905.
*Uredo Stevensiana* Arth. Mycologia **7**: 326. 1915.
*Dicaeoma tubulosum* Arth. & Fromme, N. Am. Fl. **7**: 288. 1920.

On *Axonopus compressus* (Sw.) Beauv.
*Paspalum conjugatum* Berg.
*Paspalum paniculatum* L. (See under *Puccinia substriata*.).

*Paspalum plicatulum* Michx.
*Solanum torvum* Sw.
*Syntherisma digitata* (Sw.) Hitchc. (See under *Puccinia substriata.*).
*Valota insularis* (L.) Chase. (See under *Puccinia substriata.*).

Aecidia are exceedingly common on *S. torvum* throughout Porto Rico as are also the forms on the grass hosts. Also in Vieques:—Texas, Central America, Cuba, South America, and Asia.

69. **Puccinia Urbaniana** P. Henn. Hedwigia **37:** 278. 1898.

*Micropuccinia Urbaniana* Arth. & Jackson, N. Am. Fl. **7:** 558. 1922.

On *Valerianoides cayennense* (L. C. Rich.) Kuntze Reported by Stevenson, Jour. Dept. Agr. Porto Rico, **2:** 174.
*Valerianoides jamaicense* (L.) Kuntze (*Stachytarpheta jamaicensis* Vahl).
*Valerianoides strigosum* (Vahl) Britton (*Stachytarpheta strigosa* Vahl).

One of the most common short cycle rusts in Porto Rico; also in Vieques, Mona, St. Thomas, and St. Croix:—Florida, Central America, Jamaica, Bahamas, Cuba, South America.

70. **Puccinia velata** (Ellis & Ev.) Arth. Am. Jour. Bot. **5:** 472. 1918.

*Uredo velata* Ellis & Ev. Bull. Torrey Club **22:** 435. 1895.
*Puccinia Euphorbiae minor* Holway, Bot. Gaz. **24:** 31. 1897.
*Bullaria velata* Arth. & Mains, N. Am. Fl. **7:** 487. 1922.

On *Aklema petiolare* (Sims) Millsp. (*Euphorbia petiolaris* Sims).
Formerly referred to *Puccinia Euphorbiae* P. Henn. in error. Known in this flora only from Mona and St. Thomas:—Mexico, Hawaii, Guatamala.

71. **Puccinia Xanthii** Schw. Schr. Nat. Ges. Leipzig **1:** 73. 1822.

*Micropuccinia Xanthii* Arth. & Jackson; Arth. Bull. Torrey Club **48:** 42. 1921.

On *Xanthium chinense* Mill. (*Xanthium longirostre* Wallr.).
A single collection recorded by Stevenson from Porto Rico near Santurce:—United States, Mexico, Cuba, Santo Domingo, Hawaii.
**Puccinia Zorniae** Arth. see *Puccinia offuscata* Arth.

### 9. **AECIDIUM** (Form Genus).

Sori erumpent; the spore mass usually surrounded by a peridium which may be cupulate, firm or evanescent; the spores catenulate, one-celled, the wall usually colorless, the pores rarely visible. Here are included unattached aecial stages or unrecognized species of *Endophyllum.*

1. **Aecidium abscedens** Arth. Mycologia **7:** 315. 1915.

On *Randia mitis* L. (*Randia aculeata* L.).
Field observations indicate that this may be the aecial stage of *Uromyces leptodermus* Syd. (Mycologia **18:** 43. 1926).
Very common throughout Porto Rico:—Mexico, Central America.

2. **Aecidium Borreriae** Pat.; Duss. Enum. Champ. Guad. 7. 1903.

On *Hemidiodia ocimifolia* (Willd.) K. Schum. (*Spermacoce ocimifolia* Willd.).
Systemic, often badly parasitized.
Not uncommon in Porto Rico:—Guadeloupe, South America.

**Aecidium circumscriptum** Schw.

See *Endophyllum circumscriptum* (Schw.) Whetzel & Olive.

**Aecidium decoloratum** Schw.

See *Endophyllum decoloratum* (Schw.) Whetzel & Olive.

**Aecidium expansum** Arth. not Diet.

See *Endophylloides portoricensis* Whetzel & Olive.

3. **Aecidium favaceum** Arth. Mycologia **7:** 254. 1915.

On *Margaritaria nobilis* L.f. (*Phyllanthus nobilis* (L. f.) Müll.-Arg.).
Several collections from Porto Rico; not known elsewhere.

**Aecidium passifloriicola** P. Henn.

See *Puccinia Scleriae* (Paz.) Arth.

**Aecidium Stachytarphetae** P. Henn.

See *Endophyllum Stachytarphetae* (P. Henn.) Whetzel & Olive.

4. **Aecidium Tournefortiae** P. Henn. Hedwigia **34:** 338. 1895.

On *Tournefortia bicolor* Sw.
*Tournefortia hirsutissima* L.
*Tournefortia microphylla* Bert. The rust reported on this host (Mycologia **9:** 88) as *Aecidium Tournefortiae* is *Uromyces dolichosporus* Diet. & Holw.
Rather rare in Porto Rico:—Cuba, Panama and South America.

**Aecidium tubulosum** Pat. & Gaill.

See *Puccinia tubulosa* (Pat. & Gaill.) Arth.

**Aecidium Wedeliae** Earle.

See *Endophyllum decoloratum* (Schw.) Whetzel & Olive.

10. **UREDO** (Form Genus).

Uredinia erumpent, sometimes surrounded by peridium or paraphyses; the spores pedicellate, one-celled, the wall colored or colorless, echinulate or verrucose, the pores usually evident, variously disposed.

**Uredo Aeschynomenis** Arth.

See *Phakopsora Aeschynomenis* Arth.

1. **Uredo Anthurii** (Hariot) Sacc. Syll. Fung. **11:** 229. 1895.

*Caeoma Anthurii* Hariot, Jour. de Bot. **6:** 458. 1892.

On *Anthurium scandens* (Aubl.) Engler.
A single collection from Porto Rico by Stevens. Otherwise only from a greenhouse in France.

**Uredo Arachidis** Lagerh.

See *Uromyces Arachidis* (Speg.) P. Henn.

2. **Uredo Artocarpi** Berk. & Br., Jour. Linn. Soc. **14:** 93. 1873.

*Physopella* (?) *Artocarpi* Arth. N. Am. Fl. **7:** 103. 1907.

On *Artocarpus communis* Forst.
Apparently rather rare in Porto Rico:—Cuba, India.

**Uredo biocellata** Arth.

See *Puccinia Plucheae* Syd.

3. **Uredo Bixae** Arth. Mycologia **7**: 327. 1915.

On *Bixa Orellana* L.
Known only from Porto Rico.

4. **Uredo Borreriae** P. Henn.) Kern & Whetzel. Mycologia **18**: 42. 1926.

*Uromyces Borreriae* P. Henn. Hedwigia **35**: 227. 1896.

On *Borreria verticillata* (L.) G. F. W. Meyer.
But two collections of this rust are known from Porto Rico, both by Seaver and Chardon from near Rio Piedras. The sori occur intermixed with those of *Puccinia lateritia* Berk. & Curt.—South America.

5. **Uredo Buchenaviae** Kern & Whetzel, Mycologia **18**: 41. 1926.

On *Buchenavia capitata* (Vahl) Eichl.
Known only from the type locality near Guaynabo, Porto Rico.

**Uredo Cabreriana** Kern & Kellerm.

See *Dicheirinia binata* (Berk.) Arth.

**Uredo Cameliae** Mayor.

See *Puccinia Cameliae* (Mayor) Arth.

**Uredo capituliformis** P. Henn.

See *Olivea capituliformis* (P. Henn.) Arth.

6. **Uredo Campeliae** Kern & Whetzel, Mycologia **18**: 40. 1926.

On *Campelia Zanonia* (L.) H.B.K.
Known only from the type locality, near Villalba, Porto Rico.

7. **Uredo Clusiae** Arth. Mycologia **9**: 91. 1917.

On *Clusia rosea* Jacq.
Known only from the type locality, Maricao, Porto Rico.

8. **Uredo Coccolobae** P. Henn. Hedwigia **35**: 253. 1896.

On *Coccolobis uvifera* (L.) Jacq.
Not uncommon in Porto Rico and Vieques:—Cuba, South America.

**Uredo Commelyneae** Kalchbr.

See *Phakopsora tecta* Jackson & Holw.

**Uredo concors** Arth.

See *Phakopsora Vignae* (Bres.) Arth.

9. **Uredo Cupheae** P. Henn. Hedwigia **34**: 99. 1895.

On *Parsonsia Parsonsia* (L.) Britton (*Cuphea Parsonsia* R. Br.).
Several collections from Porto Rico:—Cuba and South America.

10. **Uredo Dichromenae** Arth. Bull. Torrey Club **33:** 31. 1906.

*Dicaeoma* (?) *Dichromenae* Arth., N. Am. Fl. **7:** 351. 1920.

On *Dichromena ciliata* Vahl.
*Dichromena radicans* Cham. & Schl.

Rather common in Porto Rico:—Jamaica, South America.

11. **Uredo Dioscoreae** P. Henn. Hedwigia **35:** 255. 1896.

On *Dioscorea polygonoides* H. & B.
*Rajania cordata* L.

*U. Dioscoreae* is now considered a synonym of *Sphenospora pallida* (Wint.) Diet. The Porto Rican specimens may be erroneously referred here (see Mycologia **18:** 157–159, 1926).

Not uncommon in Porto Rico:—Cuba, South America, Asia.

12. **Uredo Erythroxylonis** Graz. Bull. Soc. Myc. Fr. **7:** 152. 1891.

On *Erythroxylon areolatum* L.
*Erythroxylon brevipes* DC.

Rare, in Porto Rico, Mona, and St. Croix:—Cuba, South America.

**Uredo fallaciosa** Arth.

See *Puccinia fallaciosa* Arth.

**Uredo farinosa** P. Henn. Hedwigia **36:** 216. 1897.

On *Ocotea leucoxylon* (Sw.) Mez.

Known in Porto Rico from a single locality in mountains above Yauco:—South America.

This fungus causes striking dusty brown deformations of the inflorescence of this tree host. It has been referred by Patouillard to the imperfect fungi under the name *Clinoconidium farinosum* (Bull. Soc. Myc. Fr. **14:** 156. See also Mycologia **18:** 43. 1926).

**Uredo fenestrala** Arth.

See *Phakopsora fenestrala* Arth.

**Uredo Fuirenae** P. Henn.

See *Puccinia fuirenicola* Arth.

**Uredo globulosa** Arth.

See *Uromyces affinis* Wint.

**Uredo Gouaniae** Ellis & Kelsey.

See *Puccinia invaginata* Arth. & Johnston.

13. **Uredo Guacae** Mayor, Mem. Soc. Neuch. Sci. Nat. **5:** 583. 1913.

On *Amphiglottis difformis* (Jacq.) Britton (*Epidendrum difforme* Jacq.).
*Amphiglottis corymbosa* (Lindl.) Britton (*Epidendrum corymbosum* Lindl.). In herb. N. Y. Bot. Gard. *2305.*
*Spathiger rigidus* (Jacq.) Small (*Epidendrum rigidum* Jacq.).

Rare in Porto Rico:—South America.

14. **Uredo guaynabensis** Kern & Whetzel, Mycologia **18**: 41. 1926.

On *Jussiaea angustifolia* Lam.
Known in Porto Rico only from the type locality, near Guaynabo:—Isle of Pines and Jamaica.

**Uredo Gymnogrammes** P. Henn.

See *Desmella superficialis* (Speg.) Syd.

15. **Uredo Gynandrearum** Corda, Ic. Fung. **3**: 3. 1839.

On *Habenaria maculosa* Lindl.
*Prescottia oligantha* (Sw.) Lindl.

Rare in Porto Rico:—Cuba, Jamaica, South America.

16. **Uredo Hameliae** Arth. Mycologia **8**: 23. 1916.

On *Hamelia erecta* Jacq. (*H. patens* Jacq.).
Rare in Porto Rico:—Costa Rica.

**Uredo Heliconiae** Diet.

See *Puccinia Heliconiae* (Diet.) Arth.

17. **Uredo Hymenaeae** Mayor, Mem. Soc. Neuch. Sci. Nat. **5**: 585. 1913.

On *Hymenaea Courbaril* L.
Several collections from Porto Rico:—Cuba and South America.

18. **Uredo ignava** Arth. Bull. Torrey Club **46**: 121. 1919.

*Dicaeoma ignavum* Arth. & Fromme, N. Am. Fl. **7**: 341. 1920.
*Puccinia* (?) *ignava* Arth. Mycologia **14**: 17. 1922.

On *Bambos vulgaris* Schrad.
Fairly common Porto Rico:—Cuba and Jamaica.

19. **Uredo incomposita** Kern, Mycologia **11**: 143. 1919.

*Dicaeoma incompositum* Arth. N. Am. Fl. **7**: 348. 1920.

On *Eleocharis geniculata* (L.) R. Br. This report in Mycologia **11**: 143 is an error in host determination.
*Eleocharis interstincta* (Vahl) R. & S.

Rather rare in Porto Rico:—Guatemala.

20. **Uredo jatrophicola** Arth. Mycologia **7**: 331. 1915.

On *Adenoropium gossypifolium* (L.) Pohl. (*Jatropha gossypifolia* L.).
*Curcas Curcas* (L.) Britton & Millsp. (*Jatropha Curcas* L.).

Common in Porto Rico, also in Vieques and St. Croix:—Cuba, Santo Domingo.

21. **Uredo laeticolor** Arth. Bull. Torrey Club **47**: 473. 1920.

*Uredo Operculinae* Arth. Mycologia **9**: 95. 1917. Not *U. Operculinae* Sydow. 1913.

On *Ipomoea dissecta* (Jacq.) Pursh. (*Operculina dissecta* House).
Rather rare in Porto Rico:—Cuba and Philippines.

22. **Uredo lutea** Arth. Mycologia **7**: 321. 1915.

On *Cassia quinquangulata* L. C. Rich. Error for *Chamaefistula antillana* Britton & Rose).
*Chamaefistula antillana* Britton & Rose.

Rare in Porto Rico; not known elsewhere.

23. **Uredo nigropuncta** P. Henn. Hedwigia **35**: 254. 1896.

*Uredo Cyrtopodii* Syd. Bull. Herb. Boiss. II. **1**: 77. 1901.

On *Bletia patula* Hook.
Rare in Porto Rico:—Cuba, Haiti, Bahamas, South America.

**Uredo notata** Arth.

See *Crossopsora notata* Arth.

**Uredo Olyrae** P. Henn.

See *Puccinia inclita* Arth.

**Uredo paspalicola** P. Henn.

See *Puccinia tubulosa* (Pat. & Gaill.) Arth.
Specimens on *Bambos vulgaris* formerly called by this name now determined to be *Uredo ignava* Arth.

24. **Uredo Piperis** P. Henn. Hedwigia Beibl. **38**: 70. 1899.

On *Peperomia hernandifolia* (Vahl) A. Dietr.
Rare in Porto Rico:—South America.

**Uredo Plucheae** Syd.

See *Puccinia Plucheae* (Syd.) Arth.

**Uredo proximella** Arth.

See *Puccinia Arthurella* Trotter & Sacc.

25. **Uredo pustulata** P. Henn. Hedwigia Beibl. **35**: 129. 1899.

On *Stenorrhynchus lanceolatus* (Aubl.) Griseb.
Rare in Porto Rico:—South America.

26. **Uredo rubescens** Arth. Mycologia **7**: 327. 1915.

On *Dorstenia Contrajerva* L.
Rare in Porto Rico:—Guatemala, Salvador, South America, Panama, Trinidad.

27. **Uredo Rousseliae** Kern & Whetzel, Mycologia **18**: 40. 1926.

On *Rousselia humilis* (Sw.) Urban.
Known only from the type locality, near Villalba, Porto Rico.

28. **Uredo sabiceicola** Arth. Mycologia **7**: 323. 1915.

On *Sabicea aspera* Aubl. Error for *S. hirsuta*.
*Sabicea hirsuta* H.B.K.
Rather rare in Porto Rico:—South America.

29. **Uredo Sauvagesiae** Arth. Mycologia **8**: 23. 1916.

On *Sauvagesia erecta* L.
Rare in Porto Rico; not known elsewhere.

30. **Uredo Sparganophori** P. Henn. Hedwigia **43**: 160. 1904.

On *Struchium sparganophorum* (L.) Kuntze (*Sparganophorus Vaillantii* Gaert.).
Rather rare in Porto Rico:—Cuba, Jamaica, South America.

**Uredo Spondiadis** Petch.

See *Cerotelium alienum* (Syd. & Butler) Arth.

**Uredo Stevensiana** Arth.

See *Puccinia tubulosa* (Pat. & Gaill.) Arth.

31. **Uredo superior** Arth. Bull. Torrey Club **31**: 5. 1904.
*Dicaeoma superius* Arth. N. Am. Fl. **7**: 351. 1920.

On *Fimbristylis ferruginea* (L.) Vahl.
*Fimbristylis spadicea* (L.) Vahl.
Several collections from Porto Rico:—Cuba, Haiti, South America.

32. **Uredo Trichiliae** Arth. Mycologia **9**: 90. 1917.

On *Trichilia pallida* Sw.
Rare in Porto Rico:—South America.

**Uredo venustula** Arth.

See *Puccinia Kaernbachii* (P. Henn.) Arth.

33. **Uredo vicina** Arth. Mycologia **7**: 325. 1915.

On *Wedelia lanceolata* DC.
Rare in Porto Rico:—South America.

Note: The name **Coleosporium Plumieriae** Pat. is to be replaced by **Coleosporium domingense** (Berk.) Arth. Am. Jour. Bot. **5**: 329. 1918. *Uredo domingensis* Berk. Ann. Mag. Nat. Hist. II. **9**: 200 (1852) is a synonym. This rust is known also from Bahamas, Guatemala, and Panama.
See p. 112.

## Sub-class 5. EUBASIDIOMYCETES.

L. O. Overholts.

This sub-class includes most of the large conspicuous fungi except those with their spores in asci. All of the fungi known as "punks," "bracket fungi," mushrooms, toadstools, puffballs, coral fungi, and their relatives belong here. Most of them are saprophytic and of little economic importance, but a few are the cause of important plant diseases. Most of the wood-inhabiting forms are of more or less importance in causing timber decays. In fact practically all of the timber-destroying fungi are true Basidiomycetes. Many species are edible, though most of the important edible species of temperate regions have not yet been found in tropical stations.

The following list is in considerable part a compilation of the species reported as occurring in the region treated. But a considerable number of species have been added from the recent collections made by expeditions from the New York Botanical Garden. Especial mention should be made of the collections by Mrs. E. G. Britton, Dr. N. L. Britton, Dr. F. J. Seaver, Dr. F. L. Stevens, Dr. Bruce Fink, Prof. H. H. Whetzel, Dr. F. D. Kern, and Mr. Carlos Chardon. Likewise, Mr. J. A. Stevenson and Prof. F. S. Earle, while in residence in Porto Rico, sent to the New York Garden many valuable collections, often with excellent descriptive notes. To these ardent collectors and to others not mentioned the present list owes whatever it may possess of originality beyond the excellent list recently published by J. A. Stevenson. Some of the nomenclatorial problems presented in previous lists have been solved in the light of the additional material available, yet undoubtedly many inaccuracies still exist and many species yet remain to be detected, particularly in the Agaricaceae where dried specimens alone are not suitable material to work with, even where accompanied by field notes. Time has also been a limiting factor in the work and a number of additional species could undoubtedly be added to the list by a prolonged study of the collections of Agarics by Earle and Stevenson.

Also the present writer is indebted to others for assistance in the work of identification. Dr. E. A. Burt, Mr. C. G. Lloyd and Dr. W. C. Coker have identified collections falling in their special fields, and finally the many years' service of Dr. W. A. Murrill, whose numerous identifications of tropical Basidiomycetes are at New York, has thrown much sadly needed light on the fungous flora of the region here treated.

In the following list some effort has been directed toward a method of presentation that would give information as to what species are here reported for the first time for this region. In general, where no comments are included the species has been previously reported and collections may or may not have been seen by the writer. Where citation is made to definite collections it is in general to be understood that these collections represent species not previously reported, and future workers may therefore have access to the exact material on which the report is based.

### Tribe 1. HYMENOMYCETES.

Hymenium (basidial layer) exposed from the first or at least long before the spores mature. (See Tribe 2. Gasteromycetes, p. 176.)

This tribe includes all of the fleshy and woody fungi usually referred to the category of "mushrooms," "toadstools," "bracket-fungi" and the like.

The following synopsis illustrates the basis of a more or less natural system of classification into orders and families largely on the structure of the basidia and the configuration of the hymenium.

Order I. Auriculariales. Basidia cylindric, transversely 3-septate; mostly but not entirely gelatinous fungi. A single family with two unrelated genera, *Auricularia* and *Septobasidium*.

Order II. Tremellales. Basidia pyriform or globose, divided by longitudinal walls into 4 cells. Mostly gelatinous fungi in the single family Tremellaceae.

Order III. Dacryomycetales. Basidia cylindric, one-celled, the upper half bifurcate, each prong bearing a spore; gelatinous fungi. A single family Dacryomycetaceae.

Order IV. Agaricales. Basidia clavate, one-celled, usually 4-sterigmate; mostly fleshy, coriaceous or woody fungi.

Fam. 1. Clavariaceae. Hymenium even; plants erect, simple or much branched, the branches terete or nearly so, fleshy or brittle in texture.

Fam. 2. Thelephoraceae. Hymenium even; plants urn-shaped, discoid, pulvinate, resupinate, pileate, or in a few cases erect and branched but the branches flattened and coriaceous or leathery in texture.

Fam. 3. Hydnaceae. Hymenium covering the exterior surface of downward directed teeth, spines, warts, or permanent granules.

Fam. 4. Boletaceae. Hymenium poroid, i.e., covering the interior surface of tubes that open downward, and that separate in a smooth layer from the flesh of the pileus.

Fam. 5. Polyporaceae. Hymenium poroid as in Boletaceae but tubes not separating in a smooth layer.

Fam. 6. Agaricaceae. Hymenium covering the exterior surfaces of radiating and downward directed gills or vein-like ridges.

## Order 1. **AURICULARIALES.**

### Family 1. **AURICULARIACEAE.**

There are but two genera in this family, *Auricularia*, with sessile and often ear-shaped fruiting bodies, gelatinous or cartilaginous in texture, and *Septobasidium*, forming dry effused patches on the substratum which is usually the living limbs of trees.

#### 1. **AURICULARIA** Bull. Herb. Fr. *pl. 290.* 1786.

1. **Auricularia Auricula** (L.) Underwood, Mem. Torrey Club **12:** 15. 1902.

*Tremella Auricula* L. Sp. Pl. 1157. 1753.
*Auricularia Auricula-Judae* (Bull.) Schroet. Krypt.-Fl. Schles. **3:** 38. 1889.

On dead wood of various kinds, Porto Rico:—cosmopolitan.
The fungus is commonly known as "Jew's ear," and is edible.

2. **Auricularia delicata** (Fries) P. Henn. Engler's Bot. Jahr. **17:** 492. 1893.

*Laschia delicata* Fries, Linnaea **5:** 533. 1830.

On dead wood, Porto Rico:—tropical regions.
Easily recognized by the strongly venose-poroid hymenium.

3. **Auricularia nigrescens** (Sw.) Farl. Bib. Index **1:** 308. 1905.

*Peziza nigrescens* Sw. Prod. 150. 1788.

On dead wood, Porto Rico; St. Thomas:—tropical regions.
In general similar to the first species but the hymenium blackish or purplish.

Doubtful Species.

*Auricularia auriformis* (Schw.) Earle, in Mohr, Contr. U. S. Nat. Herb. **6:** 194. 1901. (*Peziza auriformis* Schw. Schr. Nat. Ges. Leipzig **1:** 116. 1818). This species was reported from the Schwanecke collection but is usually regarded as at best only a yellow form of *A. Auricula.*

#### 2. **SEPTOBASIDIUM** Pat. Jour. de Bot. **6:** 61. 1892.

1. **Septobasidium lilacinum** Burt, Ann. Missouri Bot. Gard. **3:** 343. 1916.

On trunks of *Citrus grandis* Osbeck and on rotten wood, Porto Rico:—Trinidad.

2. **Septobasidium pseudopedicellatum** Burt, Ann. Missouri Bot. Gard. **3**: 327. 1916.

On living branches, Porto Rico:—Cuba; continental North America.

3. **Septobasidium spongia** (Berk. & Curt.) Pat. Bull. Soc. Myc. Fr. **16**: 181. 1900.

*Thelephora spongia* Berk. & Curt. Jour. Linn. Soc. **10**: 330. 1868.

Growing over scale insects on twigs and branches of *Citrus*, Porto Rico:—Cuba.

## Order 2. TREMELLALES.

### Family 1. TREMELLACEAE.

This family contains but three genera known from this region, *Tremella*, with gelatinous sporophores; *Tremellodendron*, a genus of white clavarioid plants; and *Heterochaete*, resupinate and non-gelatinous, with minute teeth on the hymenium, both of the latter placed here on the basis of their longitudinally four-celled basidia.

1. **HETEROCHAETE** Pat.; Pat. & Lagerh. Bull. Soc. Myc. Fr. **8**: 120. 1892.

1. **Heterochaete andina** Pat. & Lagerh. Bull. Soc. Myc. Fr. **8**: 120. 1892.

On dead sticks, Porto Rico:—Europe.

With the aspect of a *Corticium* but with subglobose basidia longitudinally four-celled, and with minute cylindric sterile teeth on the hymenium.

2. **Heterochaete sublivida** Pat. Bull. Soc. Myc. Fr. **24**: 2. 1908.

On dead wood, Porto Rico:—subtropical United States; Cuba.

Burt reports (Ann. Missouri Bot. Gard. **8**: 375. 1921) a Porto Rican collection by Stevenson (*6370*).

2. **TREMELLA** L. Sp. Pl. 1157. 1753.

1. **Tremella fuciformis** Berk. Hooker's Jour. Bot. **8**: 277. 1856.

On humus, Porto Rico:—tropical and subtropical America.

2. **Tremella pallida** sp. nov.

Plants pallid when fresh, almost white, darker and close to sayal brown on drying, cartilaginous rather than gelatinous, drying hard and horny and requiring at least an hour to soak up, 0.6-2.5 cm. broad, 0.5-1.5 cm. high, cerebriform and convoluted rather than foliaceous; internally cartilaginous-gelatinous, homogeneous and concolorous; basidia longitudinally four-celled at maturity, ovoid, 11–15 × 8–9 $\mu$; spores ellipsoid or oblong-ellipsoid, smooth, hyaline, 6–7 × 4 $\mu$.

Bursting through the bark on dead wood, Porto Rico, Jan. 24-April 5, 1923. Seaver and Chardon, *629* (New York Botanical Garden Herb.), and Overholts Herb. *9854*. Also in Lloyd Museum.

The plants are similar in size and configuration to *T. mesenterica* but in fresh condition are pale in color, almost white.

3. **Tremella indurata** sp. nov.

Forming dense convoluted-foliaceous clusters 4–5 cm. long, 2 cm. wide and high, apparently from the cracks in wood, cartilaginous rather than gelatinous,

soaking out to dusky brown or carob brown (Ridgway), drying entirely black, the convolutions very apparent in the dried plants. Hymenium on all sides of the fructifications, composed of globose basidia 13–15 $\mu$ in diameter, becoming longitudinally 4-celled and 4-sterigmate; spores subglobose or apiculate-ovate, thin-walled, with a large central oil globule, 9–11 $\mu$ diameter.

On dead wood. The type collection is *781* of Whetzel and Olive, collected at Mayaguez, Feb. 29, 1916, on trunk of fallen mango.

The species is deemed characteristic in the dark red-brown color of the fresh plants, changing to black on drying and becoming exceedingly hard. The color is similar to that of dark forms of *T. frondosa* but the plants are less foliaceous and not brittle but very hard on drying. Specimens are deposited in the Herbarium of Cornell University, in the Lloyd Museum, and in Overholts Herb. *9925*.

4. **Tremella rufolutea** Berk. & Curt. Jour. Linn. Soc. **10:** 340. 1868.

On rotten wood, Porto Rico:—Cuba.

3. **TREMELLODENDRON** Atkinson, Jour. Myc. **8:** 106. 1902.

1. **Tremellodendron simplex** Burt, Ann. Missouri Bot. Gard. **2:** 742. 1915.

In cane fields, Porto Rico:—endemic.

## Order 3. DACRYOMYCETALES.

### Family 1. DACRYOMYCETACEAE.

A single genus, *Guepinia*, has been reported from the region.

1. **GUEPINIA** Fries, Syst. Orbis Veg. 92. 1825.

1. **Guepinia palmiceps** Berk. Ann. Mag. Nat. Hist. **10:** 383. 1843.

On wood, Porto Rico:—Cuba; Ceylon.

2. **Guepinia Spathularia** (Schw.) Fries, Elench. Fung. **2:** 32. 1828.

*Merulius Spathularia* Schw. Schr. Nat. Ges. Leipzig **1:** 92. 1822.

On old wood, Porto Rico:—probably cosmopolitan.

In previous reports this species has been most often reported as *G. spathulata*, evidently an error. It forms spathulate yellow bodies in the cracks in rails and logs.

## Order 4. AGARICALES.

### Family 1. CLAVARIACEAE.

1. **CLAVARIA** L. Sp. Pl. 1182. 1755.

But two genera are known from the region, *Physalacria*, a very small simple capitate plant, on wood, and *Clavaria*, non-capitate, club-like or much branched plants, usually on the ground. *Lachnocladium* a genus of brown coriaceous clavarioid plants with hairy stem will be found in the Thelephoraceae; *Tremellodendron*, white plants of somewhat clavarioid habit, has longitudinally 4-celled basidia and belongs in the Tremellaceae.

1. **Clavaria cervina** Berk. & Curt. Jour. Linn. Soc. **10:** 338. 1868.

On dead wood, Porto Rico:—Cuba.

Determined by Coker from a collection by Chardon and Seaver, *645*, in 1923–24.

2. **Clavaria fumosa** Pers. Obs. Myc. **1**: 31. 1796.

On the ground, Porto Rico:—continental North America.

3. **Clavaria inaequalis** Müll. Fl. Dan. *Pl. 836, f. 1.* 1780.

On the ground, Porto Rico:—continental North America; Europe; Australia; Ceylon; Tasmania; New Zealand.

4. **Clavaria pilosa** Burt, Ann. Missouri Bot. Gard. **9**: 46. 1922.

On humus, Porto Rico:—endemic.
Collected by Johnston and Stevenson in 1914 and cited by Burt.

2. **PHYSALACRIA** Peck, Bull. Torrey Club **9**: 2. 1882.

1. **Physalacria inflata** (Schw.) Peck, Bull. Torrey Club **9**: 2. 1882.

*Mitrula inflata* Fries, Elench. Fung. **1**: 234. 1872.

On dead wood, Porto Rico.
Collected by Stevens in 1913, *4909 a.*

## Family 2. **THELEPHORACEAE.**

1. **ALEURODISCUS** Rabenh. Hedwigia **13**: 184. 1874.

1. **Aleurodiscus apiculatus** Burt, Ann. Missouri Bot. Gard. **5**: 186. 1918.

On bark, Porto Rico; Vieques Island:—Jamaica; Grenada.

2. **Aleurodiscus candidus** (Schw.) Burt, Ann. Missouri Bot. Gard. **5**: 188. 1918.

*Thelephora candida* Schw. Schr. Nat. Ges. Leipzig **1**: 110. 1822.

On bark of *Mangifera indica* L., Porto Rico:—Jamaica; continental North America.

3. **Aleurodiscus strumosus** (Fries) Burt, Ann. Missouri Bot. Gard. **5**: 190. 1918.

*Stereum strumosum* Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 111. 1855.

On bark of frondose trees, Porto Rico:—continental North America.

2. **ASTEROSTROMA** Massee, Jour. Linn. Soc. **25**: 154. 1890.

1. **Asterostroma cervicolor** (Berk. & Curt.) Massee, Jour. Linn. Soc. **25**: 155. 1890.

*Corticium cervicolor* Berk. & Curt. Grevillea **1**: 179. 1873.

On soil and cane trash, Porto Rico:—continental North America; Japan.

2. **Asterostroma spiniferum** Burt, Ann. Missouri Bot. Gard. **11**: 33. 1924.

On rotten wood, Porto Rico:—endemic.

3. **CLADODERRIS** Pers. in Gaud. Voy. Uranie Bot. 176. 1826.

1. **Cladoderris dendritica** (Pers.) Berk. London Jour. Bot. **1**: 152. 1842.

*Thelephora dendritica* Pers. in Gaud. Voy. Uranie Bot. 176. 1826.

On dead sugar cane, Porto Rico:—Cuba; Jamaica; Mexico; Colombia; Philippine Islands.

4. **CORTICIUM** Fries, Epicr. Myc. 556. 1838.

1. **Corticium arachnoideum** Berk. Outl. Brit. Fung. 273. 1860.

On soil and sugar cane trash, Porto Rico:—continental North America; Europe; Australia.

2. **Corticium confluens** Fries, Epicr. Myc. 564. 1838.

On dead *Citrus* branches, Porto Rico:—Europe.

3. **Corticium contiguum** Karst. Bidr. Finl. Folk. **37**: 150. 1882.

On wood, Porto Rico:—Europe.

4. **Corticium debile** Berk. & Curt. Jour. Linn. Soc. **27**: 131. 1890.

On dead wood, Porto Rico:—continental North America.

5. **Corticium investiens** (Schw.) Bres. Hymen. Hung. Kmet. 46. 1897.

*Radulum investiens* Schw. Trans. Am. Phil. Soc. **4**: 165. 1832.

On dead wood, Porto Rico:—continental America.

6. **Corticium koleroga** (Cooke) Höhn. Sitz.-ber. Akad. Wien **119**: 395. 1910.

*Pellicularia koleroga* Cooke, Grevillea **4**: 116. 1876.

On different species and varieties of coffee, Porto Rico:—Europe.

7. **Corticium lactescens** Berk. Outl. Brit. Fung. 274. 1860.

On dead wood, Porto Rico:—Europe.

8. **Corticium portentosum** Berk. & Curt. Grevillea **2**: 3. 1873.

On dead wood, Porto Rico:—continental North America.

9. **Corticium salmonicolor** Berk. & Br. Jour. Linn. Soc. **14**: 71. 1875.

On *Citrus grandis* Osbeck, *Citrus sinensis* (L.) Osbeck, *Theobroma Cacao* L., Porto Rico:—Ceylon.

10. **Corticium simile** Berk. & Curt. Jour. Linn. Soc. **10**: 337. 1868.

On dead sticks, Porto Rico:—Cuba.

11. **Corticium subcontinuum** Berk. & Curt. Jour. Linn. Soc. **10**: 337. 1868.

On dead sticks, Porto Rico:—Cuba.

12. **Corticium vagum** Berk. & Curt. Grevillea **1**: 179. 1873.

Reported by Barrett on *Solanum tuberosum* L. and the *Rhizoctonia* stage collected by Whetzel and Kern at Comerio, June 13, 1924, on *Phaseolus vulgaris* L.

5. **CYMATELLA** Pat. Bull. Soc. Myc. Fr. **15**: 193. 1899.

1. **Cymatella pulverulenta** (Berk. & Curt.) Sacc. & Syd. in Sacc. Syll. Fung. **16**: 50. 1902.

*Craterellus pulverulentus* Berk. & Curt. Jour. Linn. Soc. Bot. **10**: 328. 1868.

On decaying bark, Porto Rico:—Cuba.

6. **HYMENOCHAETE** Lév. Ann. Sci. Nat. III. **5**: 150. 1846.

1. **Hymenochaete Cacao** Berk. Jour. Linn. Soc. **10**: 333. 1868.

Reported from the Sintenis collection, Porto Rico:—Cuba.

2. **Hymenochaete corrugata** (Fries) Lév. Ann. Sci. Nat. Bot. III. **5**: 152. 1846.

*Thelephora corrugata* Fries, Obs. Myc. **1**: 154. 1815.

On dead twigs, Porto Rico:—temperate and tropical America; Europe.

A single collection made at Rio Piedras in 1919 by Earle, *239* is referred here after careful comparisons. The spores are cylindric, 5–6 × 1.5–2 $\mu$; setae abundant, 6–9 $\mu$ diameter.

3. **Hymenochaete cubensis** Burt, Ann. Missouri Bot. Gard. **5**: 337. 1918.

On rotten wood, Porto Rico:—Cuba.

4. **Hymenochaete damaecornis** (Link) Lév. Ann. Sci. Nat. III. **5**: 151. 1846.

*Stereum damaecorne* Link, Ges. Nat. Freunde Berlin Mag. **3**: 40. 1809.

On dead wood, Porto Rico:—Cuba; Santo Domingo.

5. **Hymenochaete luteo-badia** (Fries) Höhn. & Litsch. Sitz.-ber. Akad. Wien **116**: 754. 1907.

*Thelephora luteo-badia* Fries, Linnaea **5**: 526. 1830.

On rotten wood, Porto Rico:—Trinidad; continental South America.

*Thelephora* (*Hymenochaete*) *Kunzei* Hooker of some lists is given as a synonym by Burt.

6. **Hymenochaete multisetae** Burt, Ann. Missouri Bot. Gard. **5**: 357. 1918.

On rotten wood, Porto Rico:—Cuba, Jamaica.

A collection made at Rio Piedras, by Earle, *140*, is referred here.

7. **Hymenochaete opaca** Burt, Ann. Missouri Bot. Gard. **5**: 364. 1918.

On fallen limbs, Porto Rico:—Jamaica.

A collection, *243*, by Earle at Rio Piedras in 1919 differs from *H. corrugata* in those features described by Burt as characteristic of *H. opaca*. The color approaches bister only in young fructifications, however, older ones being yet darker than he records and approaching bone brown. Sections are quite opaque, and altogether the agreement is so close that I have had no hesitancy in referring the collection to that species.

8. **Hymenochaete rubiginosa** (Dicks.) Lév. Ann. Sci. Nat. III. **5**: 151. 1846.

*Helvella rubiginosa* Dicks, Fasc. Pl. Crypt. Brit. **1**: 20. 1785.

On dead wood, Porto Rico:—Europe; continental North America; Tasmania; Australia; India.

9. **Hymenochaete Sallei** Berk. Jour. Linn. Soc. **10**: 333. 1868.

On dead wood, Porto Rico:—Cuba; Jamaica; St. Kitts; Grenada; continental America.

7. **HYPOCHNUS** Fries, Obs. Myc. **2**: 278. 1818.

1. **Hypochnus pallescens** (Schw.) Burt, Ann. Missouri Bot. Gard. **4**: 267. 1917.

*Corticium pallens* Schw. in Sacc. Syll. Fung. **6**: 586. 1888.

On dead wood, Porto Rico:—Cuba; Jamaica; Trinidad; continental North America.

2. **Hypochnus rubrocinctus** Ehr. Horae Phys. Berol. 84. 1820.

On dead wood, Porto Rico:—Cuba; continental North and South America; Australia.

8. **MICROSTROMA** Niessl, Oesterr. Bot. Zeits. **11**: 252. 1861.

1. **Microstroma ingaicola** Lamkey; Stevens, Mycologia **12**: 52. 1920.

Producing witches' brooms on *Inga Inga* (L.) Britton, Porto Rico:—endemic.

2. **Microstroma Pithecolobii** Lamkey; Stevens, Mycologia **12**: 52. 1920.

Producing white hypophyllous spots on *Samanea Saman* (Willd.) Merrill, Porto Rico:—endemic.

9. **MYCOBONIA** Pat. Bull. Soc. Myc. Fr. **10**: 76. 1894.

1. **Mycobonia flava** (Schwartz) Pat. Bull. Soc. Myc. Fr. **10**: 77. 1894.

*Peziza flava* Schwartz, Prodr. 150. 1782.

On dead wood, Porto Rico:—Cuba; continental South America.
A single good collection by Stevens, *7429*, in 1915 is at New York.

10. **PENIOPHORA** Cooke, Grevillea **8**: 20. 1879.

1. **Peniophora cinerea** (Fries) Cooke, Grevillea **8**: 20. 1879.

*Corticium cinereum* Fries, Epicr. Myc. 563. 1838.

On dead twigs and branches of species of *Citrus*, Porto Rico:—Europe; continental North America.

2. **Peniophora flavido-alba** Cooke, Grevillea **8**: 21. 1879.

On dead wood and cane trash, Porto Rico:—continental North America.
In microscopic structure this species seems to me to be very close to *P. laevis* (Fries) Burt.

3. **Peniophora galochroa** Bres. Hedwigia **35**: 290. 1896.

On dead wood of *Melia Azedarach* L., Porto Rico:—continental South America; Jamaica.

4. **Peniophora inconspicua** (Berk. & Curt.) Massee, Jour. Linn. Soc. **25**: 149. 1889.

*Corticium inconspicuum* Berk. & Curt. Jour. Linn. Soc. **10**: 336. 1868.

On dead deciduous wood, Porto Rico:—Cuba.
Reported only by Burt from Johnston's collections, *1664*.

5. **Peniophora mutata** (Peck) Bresadola; Bourdot & Galzin, Bull. Soc. Myc. Fr. **28**: 399. 1912.

*Corticium mutatum* Peck, Ann. Rep. N. Y. State Mus. **43**: 23. 1890.

On dead wood, Porto Rico:—continental North America, Europe, Japan.

6. **Peniophora piliseta** Burt, Ann. Missouri Bot. Gard. **12**: 242. 1925.

On rotten wood, Porto Rico:—endemic.
Burt describes this species from Johnston's collections, *971a*.

7. **Peniophora pruinata** (Berk. & Curt.) Burt, Ann. Missouri Bot. Gard. **12**: 340. 1925.

*Stereum pruinatum* Berk. & Curt. Jour. Linn. Soc. **10**: 332. 1868.

On rotten wood, Porto Rico:—West Indies: continental North America.

The species is reported by Burt from the collections of Britton and Marble, *1204*.

8. **Peniophora Ravenelii** Cooke, Grevillea **8**: 21. 1879.

On dead wood, Porto Rico:—continental North America.

9. **Peniophora Roumeguerii** Bres.; Burt, Ann. Missouri Bot. Gard. **12**: 270. 1925.

*Corticium Roumeguerii* Bres. Fungi Trid. **2**: 36. 1892.

On dead wood, Porto Rico:—Cuba; Europe; continental North America.

Reported by Burt from Stevenson's collections, *5792*, *6058*, and *5693*.

10. **Peniophora Sacchari** Burt, Ann. Missouri Bot. Gard. **12**: 328. 1925.

On cane trash, Porto Rico:—endemic.

Burt describes this species from Stevenson's collections, *1204*.

11. **Peniophora similis** (Berk. & Curt.) Massee, Jour. Linn. Soc. **25**: 147. 1889.

*Corticium simile* Berk. & Curt. Jour. Linn. Soc. **10**: 337. 1868.

On dead wood, Porto Rico:—West Indies; continental North America; Japan.

12. **Peniophora tephra** (Berk. & Curt.) Cooke, Grevillea **8**: 20. 1879.

*Corticium tephrum* Berk. & Curt. Jour. Linn. Soc. **10**: 336. 1868.

On dead wood, Porto Rico:—Cuba; Mexico; Bermuda.

The species is reported by Burt from Stevenson's collection, *6760*.

11. **STEREUM** Pers. Neues Mag. Bot. **1**: 110. 1794.

1. **Stereum albo-badium** Schw. Schr. Nat. Ges. Leipzig **1**: 109. 1822.

*Stereum Coffearum* Berk. & Curt. Jour. Linn. Soc. **10**: 332. 1868.

On dead citrus wood, Porto Rico:—Cuba; Bermuda; continental North America.

2. **Stereum aurantiacum** (Pers.) Lloyd, Myc. Writ. **4**: 22. 1913.

*Thelephora aurantiaca* Pers. in Gaud. Voy. Uranie Bot. 176. 1827.

*Thelephora sericella* Berk. & Curt. Jour. Linn. Soc. **10**: 328. 1868.

On the ground and wood, Porto Rico:—Cuba; Jamaica; Santo Domingo; St. Kitts; continental America.

Named by Lloyd from Fink's collections of 1915–16, *882*.

3. **Stereum caperatum** (Berk. & Mont.) Massee, Jour. Linn. Soc. Bot. **27**: 161. 1891.

*Thelephora caperatum* Berk. & Mont. Ann. Sci. Nat. III. **11**: 241. 1849.

On rotten wood, Porto Rico:—Santo Domingo; St. Kitts; tropical and subtropical America.

4. **Stereum cyphelloides** Berk. & Curt. Jour. Linn. Soc. **10**: 331. 1868.

On a bank among moss plants, Porto Rico;—Cuba.

5. **Stereum decolorans** (Berk. & Curt.) Lloyd, Syn. Stip. Stereums 36. 1913.

*Thelephora decolorans* Berk. & Curt. Jour. Linn. Soc. **10**: 328. 1868.

On old wood, Porto Rico:—tropical regions.

6. **Stereum elegans** (G. Meyer) Lloyd, Syn. Stip. Stereums 24. 1913.

*Thelephora elegans* Meyer, Fl. Esseq. 305. 1818.

On dead wood, Porto Rico:—continental South America.

7. **Stereum fasciatum** (Schw.) Fries, Epicr. Myc. 546. 1838.

*Thelephora fasciata* Schw. Schr. Nat. Ges. Leipzig **1**: 106. 1822.

On dead wood, Porto Rico:—Cuba; Jamaica; continental America; Formosa; Java; Philippine Islands.

8. **Stereum glabrescens** Berk. & Curt. Jour. Linn. Soc. **10**: 330. 1868.

On fallen twigs, Porto Rico:—Cuba; Jamaica; Dominica.

9. **Stereum Hartmanni** (Mont.) Lloyd, Myc. Writ. **4**: 34. 1913.

*Thelephora Hartmanni* Mont. Ann. Sci. Nat. II. **20**: 366. 1843.

On decaying wood, Porto Rico:—St. Kitts; Bolivia.
Named by Lloyd from Fink's collections of 1915–16, *421*.

10. **Stereum lobatum** Fries, Epicr. Myc. 547. 1838.

On dead wood, Porto Rico:—widely distributed.
After seeing the specimens at New York from various southern and tropical localities the determinations of which are marked as verified by Dr. Burt, I cannot see that there is a good distinction between this species and *S. fasciatum*. A dozen collections were made by Fink in 1915–16.

11. **Stereum Murrayi** (Berk. & Curt.) Burt, Ann. Missouri Bot. Gard. **7**: 131. 1920.

*Thelephora Murraii* Berk. & Curt. Jour. Linn. Soc. **10**: 329. 1868.
*Stereum tuberculosum* Fries, Hymen. Eur. 644. 1874.

On rotten wood, Porto Rico:—Cuba; Jamaica; continental North America.

12. **Stereum nitidulum** Berk. Hooker's Lond. Jour. Bot. **2**: 638. 1843.

On dead wood, Porto Rico:—Ceylon; Brazil; Australia.
Determined by Lloyd from collections by Chardon and Seaver, 1923.
Dr. Burt uses *S. pergamenum* Berk. as the name of this plant.

13. **Stereum papyrinum** Mont. Pl. Cell. Cuba 374. 1842.

On dead wood, Porto Rico:—Cuba; Jamaica; continental North and South America.

14. **Stereum pusiolum** Berk. & Curt. Jour. Linn. Soc. **10**: 330. 1868.

On the ground, Porto Rico:—Cuba.
The determination was made by Dr. E. A. Burt, from collections of Chardon and Seaver, *1923*.

15. **Stereum umbrinum** Berk. & Curt. Grevillea **1**: 164. 1873.

On dead wood, Porto Rico:—Cuba; Guatemala; continental North America; Australia.

16. **Stereum versicolor** (Schwartz) Fries, Epicr. Myc. 547. 1838.

*Helvella versicolor* Schwartz, Prodr. 149. 1788.

On dead wood, Porto Rico:—Jamaica; continental North America.

*Stereum radians* Fries, reported from Porto Rico is regarded as a synonym of this species by Burt.

### Doubtful Species.

*Stereum Coffearum* Berk. & Curt. is a synonym for *S. albobadium* according to Burt, but must not be confused with *S. coffeatum* Berk. & Curt. which Burt lists as a synonym for *S. fusca* Schrad. This last species has been reported from Cuba and is likely to occur in Porto Rico.

*Stereum pergamenum* Berk., reported by Burt from Santo Domingo is listed here as *S. nitidulum* Berk.

*Thelephora sericella* Berk. & Curt. is *S. aurantiacum*, fide Lloyd. I do not find it listed by Burt, though described from Cuba.

In 1912 Johnston collected, no. *643*, at Rio Piedras a fungus on herbaceous stems that I refer to the genus *Cyphella* but because there are several very poorly described species of that genus from tropical and subtropical America I am at a loss as to its specific identity. The plants are white, floccose, about half a millimeter in width and height; the spores are copious, slightly ochraceous or hyaline, smooth, elliptic, 9–10 × 6 $\mu$; basidia usually, I think, two-spored, 15–24 × 6–7 $\mu$; branched paraphyses in the hymenium.

## Family 3. **HYDNACEAE.**

### 1. **HYDNUM** L. Sp. Pl. ed. 2. 1178. 1753.

1. **Hydnum multifidum** (Klotzsch) P. Henn. Engler's Bot. Jahrb. **17**: 493. 1893.

*Thelephora multifida* Klotzsch, Linnaea **25**: 365. 1852.

On rotten wood, Porto Rico:—tropical and subtropical America.

This species has been variously referred to *Thelephora, Hydnum, Polyporus, Craterellus*, and other genera. The hymenial configuration is at times, though rarely, truly hydnoid with cylindrical pointed teeth. Often it is more irpiciform with flattened teeth often arranged in radiating lines, and it is to this form that the type specimens apparently belong, according to the excellent description given by Hennings when he transferred the species to *Hydnum*. Such specimens will always be sought among the Hydnaceae and for that reason a name complimentary to that hymenial configuration will be retained here. In a more perfect stage of hymenial development the fungus is a *Polyporus* of the section *Polystictus* and has long been known as *P. fimbriatus*. Collections from Porto Rico by Stevens in 1913, 1915, and 1920; by Brothers Leon and Clement in 1915; and one by Lopez in 1917 are referable here.

2. **Hydnum pulcherrimum** Berk. & Curt. Jour. Bot. & Kew Gard. Misc. **1**: 235. 1849.

On dead wood, Porto Rico:—continental North America.

Two collections by Mrs. Britton and Miss Marble, *1207* and *1209* form the basis for the report of this unrecorded species for the region.

3. **Hydnum Sacchari** Spreng. Vet. Akad. Handl. **1820**: 51. 1820.

On dead cane trash, Porto Rico:—Guadaloupe.

I have not seen plants of this species. Perhaps it belongs rather under *Odontia*.

4. **Hydnum ursinum** Lloyd, sp. nov.

On dead wood, Porto Rico:—endemic.

The description of this species is to be published in Mycological Notes by Lloyd. The plants are entirely black on drying and are sessile. Named from Fink's Porto Rican collections, *2183*, in 1915–16.

2. **IRPEX** Fries, Elench. Fung. 142. 1828.

1. **Irpex discolor** Berk. & Curt.; Berk. Grevillea **1**: 145. 1873.

On rotten wood, Porto Rico:—continental North America.

2. **Irpex farinaceus** Fries, Linnaea **5**: 523. 1830.

*Cerrenella farinacea* Murrill, Southern Polyp. 32. 1915.

On rotten wood, Porto Rico:—North and South America.

According to Stevenson, *Poria portoricensis* Fries is a synonym of this species. It should probably be classed with the Polyporaceae, perhaps in the genus *Daedalea*.

3. **Irpex flavus** Klotzsch, Linnaea **8**: 488. 1833.

Porto Rico:—Australia; Peradenya; Ceylon; continental North America.

3. **ODONTIA** Pers. Obs. Myc. **2**: 16. 1799.

1. **Odontia Sacchari** Burt, Ann. Missouri Bot. Gard. **4**: 233. 1917.

On *Saccharum officinarum* L., Porto Rico:—Cuba.

2. **Odontia saccharicola** Burt, Ann. Missouri Bot. Gard. **4**: 235. 1917.

On *Paspalum* and on *Saccharum officinarum* L., Porto Rico:—endemic.

3. **Odontia Wrightii** (Berk. & Curt.) Pat.; Stevenson, Jour. Dept. Agr. Porto Rico **2**: 187. 1918.

*Kneiffia Wrightii* Berk. & Curt. Jour. Linn. Soc. **10**: 327. 1868.

On dead wood, Porto Rico:—Cuba; continental North and South America.

Family 4. **BOLETACEAE.**

A single genus *Boletus* is known to be represented in the region.

1. **BOLETUS** L. Sp. Pl. 1177. 1753.

1. **Boletus Earlei** (Murrill) comb. nov.

*Gyroporus Earlei* Murrill, Mycologia **13**: 60. 1921.

On sandy soil, in old grape fruit grove, Porto Rico:—endemic.

Family 5. **POLYPORACEAE.**

1. **DAEDALEA** Pers. Syn. Fung. 499. 1801.

1. **Daedalea repanda** Pers.; Gaud. Voy. Freyc. 168. 1826.

*Daedalea amanitoides* Beauv. Fl. Oware **1**: 44. 1805.

On dead wood, Porto Rico:—tropical America.

2. **FAVOLUS** Beauv. Fl. Oware **1**: 1. 1805.

1. **Favolus brasiliensis** Fries, Elench. Fung. 44. 1828.
*Hexagona daedalea* (Link) Murrill, Bull. Torrey Club **31**: 328. 1904.
*Hexagona Wilsonii* Murrill, Bull. Torrey Club **31**: 329. 1904.
On trunks and decaying wood, Porto Rico:—Cuba; tropical America.

2. **Favolus caperatus** Pat. Bull. Soc. Myc. Fr. **18**: 171. 1902.
On dead wood, Porto Rico:—Guadeloupe.
This rare species was collected by Earle in 1921, and specimens are preserved at New York.

3. **Favolus induratus** Berk. Ann. Mag. Nat. Hist. II. **9**: 197. 1852.
On dead wood, Porto Rico:—Santo Domingo; Hispaniola.
This was collected by Earle for the first time at Catano in 1918 and is preserved at New York. Lloyd records it as *Hexagona Miquelii* (Mont.) Lloyd but it seems to me to be a better *Favolus*.

4. **Favolus portoricensis** (Murrill) Sacc. Syll. Fung. **17**: 141. 1905.
*Hexagona portoricensis* Murrill, Bull. Torrey Club **31**: 331. 1904.
On decaying wood, Porto Rico:—endemic.
The plant is perhaps a better *Polyporus* than *Favolus*.

5. **Favolus pseudoprinceps** (Murrill) Sacc. & Trott. in Sacc. Syll. Fung. **21**: 355. 1912.
*Hexagona pseudoprinceps* Murrill, N. Am. Fl. **9**: 49. 1907.
On dead wood, Porto Rico:—endemic.

6. **Favolus tessellatula** (Murrill) Sacc. Syll. Fung. **17**: 142. 1905.
*Hexagona tessellatula* Murrill, Bull. Torrey Club **31**: 330. 1904.
On dead wood, Porto Rico:—Cuba; Santo Domingo; Jamaica.
The plants seem to me to be only small tessulate forms of *Favolus brasiliensis* which is usually striatulate on top but not infrequently is more or less tessulate.

3. **FOMES** Gill. Champ. Fr. **1**: 682. 1878.

1. **Fomes australis** (Fries) Cooke, Grevillea **14**: 18. 1885.
*Polyporus australis* Fries, Elench. Fung. **1**: 108. 1828.
*Elfvingia tornata* (Pers.) Murrill, Bull. Torrey Club **30**: 301. 1903.
On dead wood, Porto Rico; St. Thomas:—tropical and subtropical regions.
This is the tropical analogue of *Fomes applanatus* (Pers.) Wallr. of temperate regions.

2. **Fomes dependens** (Murrill) Sacc. & Trott. in Sacc. Syll. Fung. **21**: 292. 1912.
*Pyropolyporus dependens* Murrill, N. Am. Fl. **9**: 106. 1908.
On dead wood, Porto Rico:—tropical America.
A single collection was made by Britton and Shafer in 1913, *1938*.

3. **Fomes igniarius** (L.) Gill. Champ. Fr. **1**: 687. 1878.
*Boletus igniarius* L. Sp. Pl. 1176. 1753.
On dead wood, Porto Rico:—temperate regions of the world.
The species was reported from the Sintenis collection but is not otherwise known, and the report may have been an error.

4. **Fomes ligneus** (Berk.) Cooke, Grevillea **13**: 119. 1884.

*Polyporus ligneus* Berk. Ann. Mag. Nat. Hist. **3**: 387. 1821.

On wood, Porto Rico:—tropical America.

The only report of this species from the region is from the Sintenis collection. It is known from several localities in the West Indes.

5. **Fomes marmoratus** (Berk. & Curt.) Cooke, Grevillea **14**: 18. 1885.

*Polyporus marmoratus* Berk. & Curt. Proc. Am. Acad. **4**: 122. 1860.

On dead wood, Porto Rico; St. Thomas:—tropical and subtropical America.

The species is listed by Murrill as *Elfvingiella fasciata* (Sw.) Murrill. It is the tropical analogue of *Fomes fomentarius.*

6. **Fomes pectinatus** (Klotzsch) Sacc. Syll. Fung. **6**: 193. 1888.

*Polyporus pectinatus* Klotzsch, Linnaea **8**: 485. 1833.

On dead wood, Porto Rico:—tropical and subtropical America.

A single collection by Fink *2021* in 1915 is referred here.

7. **Fomes portoricensis** Overholts, sp. nov.

Pileus sessile or effused-reflexed, thin and applanate 1.5–5 — 6 × 4–12 × 0.3–1.5 cm., rigid and subwoody, yellow to ferruginous on the margin, brown or brownish black behind, narrowly zonate or concentrically striate, at first with a ferruginous tomentose layer with an underlying thin, black crust, the tomentum finally disappearing and leaving the surface distinctly incrusted; context light yellow-brown, firm, 2–5 mm. thick, showing under the microscope many imbedded brown, thick-walled hyphae that end in setae-like points, 12–21 μ diameter; hymenium grayish brown, the tubes about 2 mm. long each season, with a total length up to 1 cm. or rarely up to 3.5 cm., their mouths angular or sub-angular, rather thin-walled, entire, averaging 7 to 8 per mm.; spores globose, brown, 4–5 μ diameter; setae present projecting from the trama and the context into the tubes, 12 μ or more diameter.

On dead wood. Type collection by J. R. Johnston *119*, Nov. 30, 1911, at Rio Piedras, Porto Rico. Part of type in Overholts Herb. *9895*. Also collected at Jalapa, Mexico, by W. A. & Edna L. Murrill, Dec. 12–20, 1909, *37*.

The species is characterized by the bright yellow-brown context as in *F. rheicolor* Lloyd and otherwise is very close to that species but differs in the narrowly zonate-striate surface of the pileus and the presence of the conspicuous imbedded setae. It is apparently close also to *F. linteus* but according to a type fragment preserved at New York that also does not have imbedded setae. Mr. Lloyd has also told me in conversation that *F. linteus* does not have these setae. It may be the basis of the *F. lamaensis* Murrill reported by Stevenson. *F. extensus* lacks the bright context color of this species and has hyaline spores.

8. **Fomes rheicolor** Lloyd, Synop. Genus Fomes 245. 1915.

On dead wood, Porto Rico:—Argentine.

This interesting species is characterized by its bright yellow context, and may belong in *Polyporus* rather than *Fomes.*

9. **Fomes Robinsoniae** (Murrill) Sacc. & Trott. in Sacc. Syll. Fung. **21**: 291. 1912.

*Pyropolyporus Robinsoniae* Murrill, N. Am. Fl. **9**: 108. 1908.

On dead wood, Porto Rico:—Jamaica.

A fine collection, the second on record, was made by Stevens, *8609*, in 1915. The original description stating "cystidia none" is an error, as the hymenium of both known collections is sparingly setulose, the setae often with characteristically curved tips.

10. **Fomes sarcitus** (Fries) Cooke, Grevillea **14**: 19. 1885.

*Polyporus sarcitus* Fries, Nov. Symb. 66. 1851.

On dead wood, St. Jan:—endemic.

11. **Fomes scutellatus** (Schw.) Cooke, Grevillea **14**: 19. 1885.

*Polyporus scutellatus* Schw. Trans. Am. Phil. Soc. II. **4**: 157. 1832.

On decaying wood, Porto Rico:—eastern and southern United States and Mexico.

Two collections are preserved at New York, one by Earle in 1918, *102*, and one by Nelson in 1919.

12. **Fomes senex** (Nees. & Mont.) Sacc. Syll. Fung. **6**: 164. 1888.

*Polyporus senex* Nees & Mont. Ann. Sci. Nat. II. **5**: 70. 1836.

On dead wood, Porto Rico:—tropical and subtropical America.

Spores hyaline, globose, 4 $\mu$ diameter. Setae present, conspicuous, 8–11 $\mu$ diameter. I have examined a fragment of the type of this species at Cincinnati in which I find only hyaline spores. I refer here, therefore, a collection by Shafer *3683* in 1914, and one by Seaver and Chardon *283* in 1923.

13. **Fomes Underwoodii** (Murrill) Sacc. & D. Sacc. in Sacc. Syll. Fung. **17**: 117. 1905.

*Pyropolyporus Underwoodii* Murrill, Bull. Torrey Club **30**: 116. 1903.

On old stumps and dead trees, Porto Rico; St. Thomas:—Cuba; Jamaica. Reported as *Fomes badius* Berk. by Stevenson.

### Doubtful and Excluded Species.

*Fomes calcitratus* Berk. & Curt. There is no *F. calcitratus* at New York from Porto Rico, and I agree with Lloyd that most of the specimens Murrill refers here are *F. pseudosenex*. I presume Stevenson's record is on the basis of Murrill's determinations. I believe the species occurs in Cuba and may be expected in Porto Rico.

*Fomes linteus* Berk. Reported by Stevenson, probably on the basis of the collection here made the type of *F. portoricensis*. *F. linteus* does not have imbedded setae.

## 4. **HEXAGONA** Pollini, Pl. Nov. 35. 1816.

1. **Hexagona leprosus** Fries, Nov. Symb. 101. 1851.

*Favolus leprosus* (Fries) Murrill, N. Am. Fl. **9**: 83. 1908.

On dead wood, St. Jan:—endemic.

2. **Hexagona variegata** Berk. Ann. Mag. Nat. Hist. II. **9**: 196. 1852.

*Favolus variegatus* (Berk.) Murrill, Bull. Torrey Club **32**: 101. 1905.

On dead wood, Porto Rico:—tropical America.

## 5. **LASCHIA** Fries, Linnaea **5**: 533. 1830.

1. **Laschia pezizoidea** Berk. & Curt. Jour. Linn. Soc. **10**: 322. 1868.

On rotten wood, Porto Rico:—Cuba.

Three collections by Johnston are referred here more or less tentatively, collected in 1911 and 1912 and numbered *117*, *333*, and *435*.

### 6. **LENZITES** Fries, Gen. Hym. 10. 1836.

1. **Lenzites saepiaria** (Wulf.) Fries, Epicr. Myc. 407. 1838.

*Agaricus saepiarius* Wulfen, in Jacq. Coll. **1**: 339. 1786.
*Gloeophyllum hirsutum* (Schaeff.) Murrill, Jour. Myc. **9**: 94. 1903.

On dead wood, Porto Rico:—north temperate zone, rarely tropical and subtropical.

A single collection made at Arecibo by Earle in 1918 is the basis of this record. It differs from *L. striata* in the presence of a red or rusty coloration in the surface of the pileus, a tendency to be more strongly zonate, more pubescent, and with thicker gills.

2. **Lenzites striata** (Sw.) Fries, Epicr. Myc. 406. 1838.

*Agaricus striatus* Sw. Prodr. 148. 1788.
*Gloeophyllum striatum* (Sw.) Murrill, Bull. Torrey Club **32**: 370. 1905.

On dead wood, Porto Rico; St. Jan:—tropical America.

### 7. **MERULIUS** Haller, Hist. Stirp. Helvetiae **3**: 150. 1768.

1. **Merulius byssoideus** Burt, Ann. Missouri Bot. Gard. **4**: 358. 1917.

On soil, Porto Rico:—endemic.

2. **Merulius rugulosus** Berk. & Curt. Jour. Linn. Soc. **10**: 323. 1868.

On dead wood, Porto Rico:—Cuba; Jamaica.

According to Burt (Ann. Missouri Bot. Gard. **4**: 337) *Corticium saccharinum* Berk. & Curt. is a synonym of this species.

3. **Merulius sulphureus** Burt, Ann. Missouri Bot. Gard. **4**: 333. 1917.

On rotten wood, Porto Rico:—Florida.

### 8. **POLYPORUS** (Micheli) Paulet, Traité Champ. *pl. 13*. 1812.

1. **Polyporus aculeifera** (Berk. & Curt.) comb. nov.

*Trametes aculeifera* Berk. & Curt. Jour. Linn. Soc. **10**: 319. 1868.

On dead wood, Porto Rico:—Cuba; Florida; and South America.

The species was collected by Earle at Arecibo in 1918.

2. **Polyporus adustus** (Willd.) Fries, Syst. Myc. **1**: 363. 1821.

*Boletus adustus* Willd. Fl. Berol. 392. 1787.

On dead wood, Porto Rico:—cosmopolitan.

But two collections are known from the region, and the species has not been reported previously (Britton, Cowell, and Brown, *4492, 1915*.).

3. **Polyporus albogilvus** Berk. & Curt. Jour. Linn. Soc. **10**: 308. 1868.

On dead wood, Porto Rico:—Cuba.

A single collection by Earle, *160*, so referred at New York seems rather doubtful to me. According to Lloyd *P. flavescens* Mont. is a synonym and Stevenson reports a plant under that name.

4. **Polyporus anebus** Berk. Hooker's Lond. Jour. Bot. **6**: 504. 1847.

On dead wood, Porto Rico:—oriental tropics and Africa.

I have not seen specimens of this species reported by Stevenson. Its distribution would not indicate its presence in Porto Rico.

5. **Polyporus antilopus** (Kalchbr.) Lloyd, Syn. Stip. Polyp. 142. 1912.

*Polyporus vibecinus* var. *antilopus* Kalchbr. Grevillea **10**: 53. 1881.

On dead wood, Porto Rico:—tropical regions of the world.

I so refer no. *3676* of the New York Botanical Garden Herbarium, after comparisons in the Lloyd Museum. Collected by Shafer in 1914, but not otherwise known from the region.

6. **Polyporus argillaceus** (Murrill) comb. nov.

*Ganoderma argillaceum* Murrill, N. Am. Fl. **9**: 122. 1908.

On dead trunks, St. Croix:—Cuba; Mexico; Grenada.

7. **Polyporus armenicolor** Berk. & Curt. Jour. Linn. Soc. **10**: 315. 1868.

*Coriolus armenicolor* (Berk. & Curt.) Pat. Tax. Hymen. 94. 1900.

On dead wood, Porto Rico:—Cuba.

8. **Polyporus Blanchetianus** Berk. & Mont. Ann. Sci. Nat. III. **11**: 238. 1849.

On dead wood, Porto Rico:—tropical America.

Two collections from the island have been seen: by Stevens in 1913, *2802*, and by Seaver and Chardon in 1923, *613*.

9. **Polyporus Brittonii** (Murrill) comb. nov.

*Amauroderma Brittonii* Murrill, Mycologia **2**: 193. 1910.

On dead wood, Porto Rico:—Jamaica.

Two specimens that I refer here with some hesitation were collected by Nelson in 1919. They are much smaller than the type and may represent an undescribed species. The spores measure 7–8 × 4–6 $\mu$ and are echinulate. I did not succeed in getting good spores from the type of *P. Brittonii*. Murrill records them as subglobose, 7–8 $\mu$.

10. **Polyporus Chaperi** (Pat.) Lloyd, Syn. Stip. Pol. 112. 1912.

*Ganoderma Chaperi* Pat. Jour. de Bot. **4**: 197. 1890.

On dead wood, Porto Rico:—Cuba.

11. **Polyporus caperatus** Berk. Ann. Mag. Nat. Hist. **3**: 391. 1839.

*Coriolopsis caperata* (Berk.) Murrill, N. Am. Fl. **9**: 77. 1908.

On dead wood. Porto Rico:—tropical America; Asia; Africa.

12. **Polyporus caryophyllus** (Cooke) Lloyd, Syn. Sect. Apus 358. 1915.

*Formes caryophylleus* Cooke, Grevillea **15**: 21. 1886.

On dead wood, Porto Rico:—South America.

Collected by Johnston in 1912, *5901*, and compared at the Lloyd Museum by me.

13. **Polyporus cinnamomeus** (Jacq.) Sacc. Michelia **1**: 362. 1878.

*Boletus cinnamomeus* Jacq. Coll. **1**: 116. 1786.

On the ground, St. Thomas:—cosmopolitan.

Reported as *P. oblectans* Berk., usually regarded as a synonym.

14. **Polyporus colossus** Fries, Nov. Symb. 40. 1851.

*Tomophagus colossus* (Fries) Murrill, Torreya **5**: 197. 1905.

On rotten wood, St. Croix; St. Jan:—Yucatan; Costa Rica.

Several large specimens of this rare species were collected by Seaver in 1923 on the inside of a large decaying stump. It belongs to the section *Ganoderma*.

15. **Polyporus conchoides** (Mont.) Lloyd, Syn. Sect. Apus 331. 1915.

*Gloeoporus conchoides* Mont. Pl. Cell. Cuba 234. 1845.

On dead wood, Porto Rico:—tropical and subtropical America.

Reported only by Sintenis. Not collected in recent years, though should occur in the region.

16. **Polyporus concrescens** Mont. Ann. Sci. Nat. II. **3**: 350. 1835.

On dead wood, Porto Rico:—Cuba.

The specimens referred here at New York are scarcely in good enough condition to be named. The plant has some of the characters of *P. zonalis*, but is very thin. Closely related to *P. stereinus* Berk. & Curt.

17. **Polyporus depauperatus** Pat. Jour. de Bot. **3**: 166. 1889.

*Coriolus depauperatus* (Pat.) Murrill, N. Am. Fl. **9**: 20. 1907.

On rotten wood, Porto Rico:—Cuba; Venezuela.

A single collection by Earle in 1919, *231*, belongs here.

18. **Polyporus discoideus** Berk. & Curt. Jour. Linn. Soc. **10**: 305. 1868.

On dead wood, Porto Rico:—Cuba; Brazil.

*P. Marbleae* Murrill is a synonym.

19. **Polyporus distortus** (Schw.) Fries, Elench. Fung. 79. 1828.

*Boletus distortus* Schw. Schr. Nat. Ges. Leipzig **1**: 97. 1822.

On dead wood, Porto Rico:—continental North America.

20. **Polyporus Drummondii** Klotzsch, Linnaea **5**: 520. 1830.

*Coriolus Drummondii* (Klotzsch) Pat. Tax. Hym. 94. 1900.

On dead trunks, Porto Rico:—subtropical North America.

21. **Polyporus ectypus** Berk. & Curt. Grevillea **1**: 52. 1872.

*Coriolus ectypus* (Berk. & Curt.) Pat. Tax. Hym. 94. 1900.

On dead wood, Porto Rico:—continental North America.

22. **Polyporus fimbriatus** Fries, Linnaea **5**: 520. 1830.

On dead wood, Porto Rico:—tropical regions.

The poroid condition of this species has not yet been collected in Porto Rico or at best specimens show only a trace of a polyporoid hymenial configuration. Five or six collections with a hydnoid hymenium are known from the island and would be referred to *Hydnum multifidum* (Klotzsch) P. Henn., the types of which are hydnoid as described by Hennings. The types of *P. fimbriatus* are said by Lloyd to be poroid, and a collection at New York from Alabama is in part distinctly poroid and in part hydnoid. Stevens, *7001*, *9051*, Lopez, *39*, and Earle, *292*, belong here.

Whether or not the specimens referred to in Stevenson's check-list as *P. Drummondii* belong here I cannot say since the collections are not at New York, but Murrill referred most of the collections that came to him to that species.

23. **Polyporus flaviporus** (Murrill) Stevenson, Jour. Dept. Agr. Porto Rico **2**: 190. 1918.

*Amauroderma flaviporum* Murrill, N. Am. Fl. **9**: 116. 1906.

On dead wood, Porto Rico:—Jamaica.

A study of the type collection of this species reveals the fact that the spores are 9–12 × 6.8 μ, not 6–7 × 4–5 μ as originally stated.

24. **Polyporus fruticum** Berk. & Curt. Jour. Linn. Soc. **10**: 310. 1868.

*Inonotus fruticum* (Berk. & Curt.) Murrill, Bull. Torrey Club **31**: 601. 1904.

On branches of living trees or on dead wood, Porto Rico; Mona Island; Vieques:—Cuba; Bahamas; Jamaica; subtropical United States; Africa.

25. **Polyporus fulvocinereus** (Murrill) comb. nov.

*Coriolopsis fulvocinerea* Murrill, N. Am. Fl. **9**: 76. 1908.

On dead wood, Porto Rico; St. Croix; St. Thomas:—Cuba; Jamaica; Hispaniola; Barbados.

26. **Polyporus fumosus** (Pers.) Fries, Obs. Myc. **2**: 257. 1818.

*Boletus fumosus* Pers. Syn. Fung. 530. 1801.

On dead wood, Porto Rico:—cosmopolitan.

A single collection by Britton, Cowell, and Brown, *3943*, 1915, agreeing in all respects except of small size and on that basis similar to *P. adustus*, but I think correctly referred here.

27. **Polyporus gilvus** (Schw.) Fries, Elench. Fung. 104. 1828.

*Boletus gilvus* Schw. Schr. Nat. Ges. Leipzig **1**: 96. 1822.

On dead wood, Porto Rico; Tortola; Vieques; St. Thomas:—cosmopolitan.

28. **Polyporus guyanensis** Mont. Syll. Crypt. 153. 1856.

On dead wood, Porto Rico:—tropical America.

One collection by *Johnston, 740*, in 1912 is referred here after comparisons at the Lloyd Museum. *P. hemicapnodes* Berk. & Br. is similar but apparently more of the consistency of the *P. varius* group—hence not so fleshy as was apparently this species.

29. **Polyporus haedinus** Berk. Jour. Bot. & Kew Misc. **8**: 234. 1856.

*Coriolus haedinus* (Berk.) Pat. Tax. Hym. 94. 1900.

On dead wood, Porto Rico:—continental South America.

30. **Polyporus hirsutus** (Wulf.) Fries, Syst. Myc. **1**: 367. 1821.

*Boletus hirsutus* Wulfen, in Jacq. Coll. **2**: 149. 1788.

On dead deciduous wood of various kinds, Porto Rico; St. Thomas:—continental North America; Europe; Asia.

31. **Polyporus havannensis** Berk. & Curt. Jour. Linn. Soc. **10**: 310. 1868.

*Trametes havannensis* (Berk. & Curt.) Murrill, N. Am. Fl. **9**: 44. 1907.

On dead wood, St. Thomas, Porto Rico:—Cuba.

Reported by Stevenson and collected by Fink in 1918. Lloyd and Stevenson both suggest that it may be referable to *Polyporus subfulvus* Berk. but there appear to be good distinguishing characters to separate the species, especially under the microscope. *P. subfulvus* is a manuscript name proposed by Berkeley and used by Lloyd for *P. ochrotinctellus* Murrill, as I understand it. The *Trametes havannensis* specimens at New York are not the same as that species. Besides, there is a *P. subfulvus* Cooke, the history of which I have not been able to trace.

32. **Polyporus iodinus** Mont. Ann. Sci. Nat. II. **16**: 108. 1841.
*Cycloporellus iodinus* (Mont.) Murrill, N. Am. Fl. **9**: 85. 1908.
On dead wood, Porto Rico:—tropical America.
At least five collections of this hitherto unreported species are at New York.

33. **Polyporus licnoides** Mont. Pl. Cell. Cuba 243. 1845.
*Hapalopilus licnoides* (Mont.) Murrill, Bull. Torrey Club **31**: 417. 1904.
On dead wood, Porto Rico; St. Croix:—tropical and subtropical America.
var. *sublilacinus* Ellis & Ev. Bull. Torrey Club **27**: 50. 1900.
On dead wood, Porto Rico:—tropical and subtropical America.
This is the perennial form of *P. licnoides*, the margin and the hymenium continuing growth.

34. **Polyporus lignosus** Klotzsch, in Fries, Epicr. Myc. 471. 1838.
*Fomes Auberianus* (Mont.) Murrill, Bull. Torrey Club **32**: 491. 1905.
On dead or injured trees, Porto Rico:—tropical regions.

35. **Polyporus lucidus** (Curt.) Fries, Syst. Myc. **1**: 353. 1821.
*Boletus lucidus* Curt. Fl. Lond. **4**: 72. 1781.
On dead wood or from wounds in living trees, Porto Rico:—Europe; North and South America; Africa.

36. **Polyporus maximus** (Mont.) comb. nov.
*Irpex maximus* Mont. Ann. Sci. Nat. II. **8**: 364. 1837.
On dead wood, Porto Rico; Vieques; St. Thomas:—Cuba.

37. **Polyporus modestus** Fries, Linnaea **5**: 519. 1830.
*Coriolus brachypus* (Lév.) Murrill, Bull. Torrey Club **32**: 646. 1906.
On dead wood, Porto Rico:—tropical regions.
No specimens of this species have been seen and it is known only from Klotzsch's report on the Schwanecke collection, though not uncommon in tropical America.

38. **Polyporus mutabilis** Berk. & Curt. Ann. Mag. Nat. Hist. II. **12**: 433. 1853.
*Microporellus dealbatus* Murrill, Bull. Torrey Club **32**: 483. 1905.
On dead wood, Porto Rico:—tropical and North America.

39. **Polyporus nitidus** (Murrill) comb. nov.
*Ganoderma nitidum* Murrill, N. Am. Fl. **9**: 123. 1908.
On dead wood, Porto Rico:—Honduras.
This is recorded by Stevenson under the name *P. fulvellus* Bres.

40. **Polyporus nivosellus** (Murrill) Stevenson, Jour. Dept. Agr. Porto Rico **2**: 191. 1918.
*Tyromyces nivosellus* Murrill, N. Am. Fl. **9**: 32. 1907.
On dead palm trunks, *Cocos* and *Roystonea*, Porto Rico:—Cuba.
This seems to be very close to *P. Calkinsii* and probably is one extreme of development of that species.

41. **Polyporus obolus** Ellis & Macbr.; Ellis & Ev. Bull. Lab. Nat. Hist. Univ. Iowa **4**: 68. 1896.
On dead wood, Porto Rico:—tropical America.

Two collections referred to this species are preserved at New York, both by Britton and Cowell, *3088* and *1050*. The species is readily distinguished by the gelatinous nature of the context which in crushed preparations is seen to be made up entirely of gelatinous hyphae of large diameter with numerous cross walls, and very irregular in form.

42. **Polyporus occidentalis** Klotzsch, Linnaea **8**: 486. 1833.

*Coriolopsis occidentalis* (Klotzsch) Murrill, Bull. Torrey Club **32**: 358. 1905.

On various kinds of dead wood, Porto Rico:—St. Vincent; West Indies.

43. **Polyporus ochrotinctellus** (Murrill) comb. nov.

*Coriolus ochrotinctellus* Murrill, N. Am. Fl. **9**: 22. 1907.

On dead wood, Porto Rico:—Cuba; subtropical North America.

Stevenson reports this species under the name *P. subfulvus* Berk., a manuscript name resurrected by Lloyd to apply to it.

44. **Polyporus pallidofulvellus** (Murrill) comb. nov.

*Coriolus pallidofulvellus* Murrill, N. Am. Fl. **9**: 20. 1907.

On dead wood, Porto Rico:—Cuba; subtropical North America. Collected by Seaver and Chardon in 1923 and by Mrs. Britton and Miss Marble in 1906. Perhaps too close to *P. biformis* Klotzsch of temperate regions.

45. **Polyporus Palmarum** (Murrill) Sacc. & Trott. in Sacc. Syll. Fung. **21**: 279. 1912.

*Tyromyces Palmarum* Murrill, N. Am. Fl. **9**: 32. 1907.

On dead wood, usually on palm trunks, Porto Rico:—Cuba; Jamaica. Collected by Johnston in 1912, *717*. Perhaps too close to *P. nivosellus*.

46. **Polyporus pargamenus** Fries, Epicr. Myc. 480. 1838.

On dead wood, Porto Rico:—continental North America; Europe.

Collected by Kern and Whetzel in 1924. The specimens are small but would probably be referable to *P. elongatus* Berk., the tropical form of *P. pargamenus* when mature.

47. **Polyporus pavonius** (Hook.) Fries. Epicr. Myc. 477. 1838.

*Boletus pavonius* Hook. in Kunth, Syn. Pl. **1**: 10. 1822.

On dead wood, Porto Rico, St. Thomas; St. Jan:—Colombia to southern Florida.

48. **Polyporus perzonatus** (Murrill) Stevenson, Jour. Dept. Agr. Porto Rico **2**: 191. 1918.

*Ganoderma perzonatum* Murrill, N. Am. Fl. **9**: 121. 1908.

On dead wood, Porto Rico:—Cuba.

49. **Polyporus pinsitus** Fries, Elench. Fung. 95. 1828.

*Coriolus pinsitus* (Fries) Pat. Tax. Hym. 94. 1900.

On dead wood, Porto Rico; St. Thomas; Culebra:—continental North and South America.

50. **Polyporus pulverulentus** (Murrill) comb. nov.

*Ganoderma pulverulentum* Murrill, N. Am. Fl. **9**: 121. 1908.

On dead wood, St. Thomas:—Bahamas; Cuba; Grenada.

51. **Polyporus rhipidium** Berk. in Hooker's Jour. Bot. **6**: 319. 1847.

On dead wood, Porto Rico; St. Thomas:—widely distributed in temperate and tropical regions.

The species was collected in Porto Rico by Fink and by Seaver and Chardon.

52. **Polyporus rigidus** Lév. Ann. Sci. Nat. III. **2**: 189. 1844.

On dead wood, Porto Rico:—tropical and subtropical regions.

Collected by Kern and Whetzel in 1924, by Earle in 1920, *324*, by Seaver and Chardon in 1923, *468*, and others. The species name is here applied to the pubescent and less zoned form that is sometimes referred to *P. zonalis*, but seems sufficiently distinct for recognition.

53. **Polyporus sanguineus** (L.) Fries, Epicr. Myc. 444. 1838.

*Boletus sanguineus* L. Sp. Pl. ed. 2. 1646. 1762.

On dead wood, Porto Rico; Mona Island; Vieques; Culebra; St. Croix; St. Jan; St. Thomas:—tropical and subtropical regions of the world.

54. **Polyporus sector** (Ehr.) Fries, Syst. Myc. **1**: 505. 1821.

*Boletus sector* Ehr. Horae Phys. Berol. 86. 1820.

On dead wood, Porto Rico; St. Jan:—West Indies; continental North and South America.

Two collections have been seen from the region; one in 1913 by Stevens, *1568*, and another by Mrs. Britton and Miss Marble in 1906, *1196*.

55. **Polyporus spadiceus** Jungh. Crypt. Java, 54. 1838.

On dead wood, Porto Rico:—tropical regions.

A single collection by Earle in 1918, *174*, is preserved at New York. The fungus was recognized by Mr. Lloyd, who regards it as a thick form of *P. tabacinus*.

56. **Polyporus spathulatus** (Hook.) Fries, Epicr. Myc. 443. 1838.

*Boletus spathulatus* Hooker in Kunth, Syn. Pl. **1**: 9. 1822.

On dead wood, Porto Rico:—tropical America.

57. **Polyporus stereinus** Berk. & Curt. Jour. Linn. Soc. **10**: 308. 1868.

*Rigidoporus Liebmanni* (Fries) Murrill, N. Am. Fl. **9**: 46. 1907.

On dead wood, Porto Rico:—Cuba; Mexico.

One collection so referred is preserved at New York. It is hardly in good enough condition to warrant a reference, and similar collections should also be compared with *P. concrescens* Mont. Both resemble very thin zonate forms of *P. zonalis*.

58. **Polyporus subelegans** Murrill, N. Am. Fl. **9**: 62. 1907.

On dead wood, St. Thomas:—Jamaica; Nicaragua.

I have seen no specimens of this from Porto Rico.

59. **Polyporus subglabrescens** (Murrill) comb. nov.

*Coriolopsis subglabrescens* Murrill, N. Am. Fl. **9**: 77. 1908.

On dead wood, Porto Rico:—Cuba; Jamaica.

60. **Polyporus subincrustatus** (Murrill) comb. nov.

*Ganoderma subincrustatum* Murrill, N. Am. Fl. **9**: 122. 1908.

On dead wood, Porto Rico:—British Honduras; Jamaica.

61. **Polyporus submurinus** (Murrill) Lloyd, Syn. Apus of Polyporus 307. 1915.

*Trametes submurina* Murrill, N. Am. Fl. **9**: 43. 1907.

On rotten wood, Porto Rico; St. Jan:—Cuba; Jamaica.

62. **Polyporus sulphureus** (Bull.) Fries, Syst. Myc. **1**: 357. 1821.

*Boletus sulphureus* Bull. Herb. Fr. *pl. 429*. 1788.
*Laetiporus speciosus* (Batt.) Murrill, Bull. Torrey Club **31**: 607. 1904.

On trunks of deciduous trees, Porto Rico:—cosmopolitan.

The only record is from the Sintenis collection. I have seen specimens from Jamaica and other tropical stations.

63. **Polyporus supinus** (Sw.) Fries, Syst. Myc. **1**: 376. 1821.

*Boletus supinus* Sw. Fl. Ind. Occ. 1926. 1806.

On dead wood, Porto Rico:—tropical and subtropical regions of the world.

64. **Polyporus Taylori** (Murrill) comb. nov.

*Coriolopsis Taylori* Murrill, N. Am. Fl. **9**: 76. 1908.

On dead wood, Porto Rico; St. Jan:—Honduras; Cuba.

Four collections of this species have been examined, all by Earle, the only numbers noted being *49½* and *165*.

65. **Polyporus tenuis** Sacc. Syll. Fung. **6**: 288. 1888.

On dead wood, Porto Rico:—tropical and subtropical regions.

This is *Polyporus* (*Coriolus*) *membranaceus* of Murrill's writings. Lloyd claims a misuse of the name by Murrill.

*Boletus tenuis* of Link, I do not find published. It is not in "Berl. Mag." (Ges. Nat. Freunde Berlin Mag.) as recorded by Cooke in "Praecursores Polypororum" and the description given by Saccardo is apparently drawn from the original collection. Consequently the name was a "nomen nudum" until the species was described by Saccardo.

66. **Polyporus Tricholoma** Mont. Ann. Sci. Nat. II. **8**: 365. 1837.

On dead wood, Porto Rico; St. Jan; St. Kitts:—tropical America.

Stevenson's reference of *P. obolus* here is an error, though undoubtedly *P. Cowellii* Murrill is the same species.

67. **Polyporus Tulipiferae** (Schw.) Overholts, Washington Univ. Stud. **3**: 29. 1915.

*Boletus Tulipiferae* Schw. Schr. Nat. Ges. Leipzig **1**: 99. 1822.
*Irpiciporus lacteus* (Fries) Murrill, N. Am. Fl. **9**: 15. 1907.

On dead wood, Porto Rico:—North America; Europe; Asia.

A single collection, not hitherto reported, is at New York, collected by Stevens in 1915, *7091*. The microscopic characters agree with the species of temperate regions.

68. **Polyporus versicolor** (L.) Fries, Syst. Myc. **1**: 368. 1821.

*Boletus versicolor* L. Sp. Pl. 1176. 1753.

On dead wood, Porto Rico:—cosmopolitan.

The species is not common in the region. I have seen but two collections.

69. **Polyporus vinosus** Berk. Ann. Mag. Nat. Hist. II. **9**: 196. 1852.

*Nigroporus vinosus* (Berk.) Murrill, Bull. Torrey Club **32**: 361. 1905.

On dead wood, Porto Rico:—tropical and subtropical North America.

Three collections have been seen: Johnston and Stevenson, *1504* in 1914; Fink, *2146* in 1916; Seaver and Chardon, *380*, in 1923.

70. **Polyporus zonalis** Berk. Ann. Mag. Nat. Hist. **10**: suppl. 375. 1843.

*Rigidoporus surinamensis* (Miq.) Murrill, Bull. Torrey Club **34**: 473. 1907.

On dead wood, Porto Rico:—tropical and subtropical regions of the world.

### Doubtful and Excluded Species.

*Polyporus amboinensis* Fries is reported from the Sintenis collection. The plants represent undoubtedly one of the segregates from *P. lucidus*, but which one is uncertain.

*Polyporus crocatus* Fries. Stevenson lists the species but the collection, *9011*, on which the report was probably based, preserved at New York, is *P. caperatus*, a very different plant. *P. byrsinus* is a synonym

*Polyporus elongatus* Berk. This is the tropical homologue of *P. pargamenus* Fries.

*Polyporus gracilis* Klotzsch. Perhaps a synonym for *P. obolus*.

*Polyporus hemileucus* Berk. Same as *P. supinus*.

*Polyporus hirtellus* Fries as reported by Stevenson is *P. hirsutus*.

*Polyporus Hollickii* Murrill. Both Murrill and Lloyd are in error as to this species. But a single collection, the type, is known, and from Jamaica. The other collections at New York are in part *P. havannensis*, and perhaps in part something else. Lloyd evidently based his idea, not on the type collection, but on the collections Murrill misreferred here.

*Polyporus Leprieurii* Mont. Reported only from the Sintenis collection. Specimens collected by Johnston and similar to *P. Leprieurii* and *P. hemicapnodes* I would refer rather to *P. guyanensis* after comparisons in the Lloyd museum.

*Polyporus obtusus* Berk. The status of this species is in doubt. It was reported by Sintenis (as *P. unicolor*) but not otherwise known. A similar, or perhaps identical species, *P. luridescens* Murrill, is known from Jamaica.

*Polyporus papyraceus* Fries, was described from plants collected in Porto Rico. Dr. Murrill reports that the types cannot be found. It would probably fall under *P. tenuis* of this list.

*Polyporus polyzonus* Pers. I find no record of this species except as in Stevenson's report.

*Polyporus pusillus* Pers. is said to be a synonym for *P. rhipidium* Fries.

*Polystictus rigens* is *Trametes rigida*.

*Polyporus rugulosus* Lév. This species would probably fall under either *P. zonalis* or *P. rigidus*.

*Polyporus semilaccatus*. Lloyd gives a resumé of this species on page 337 of his Synopsis of Section Apus. Its known distribution would not indicate its presence in this region.

*Polystictus sinuosus* (Fries) Lloyd, as reported in Myc. Notes **45**: 626 seems to me to be referable to the plants I have listed as *P. Tulipiferae* (Schw.) but I have not seen the collection.

*Polyporus variiporus* Murrill. Only a variant of *P. Tricholoma*.

*Polystictus velutinus* Fries, I do not know from Porto Rico. Stevenson lists it.

## 9. **PORIA** Pers. Neues Mag. Bot. **1**: 109. 1794.

1. **Poria albocincta** Cooke & Massee, Grevillea **20**: 106. 1892.

*Tinctoporia albocincta* (Cooke & Massee) Murrill, Mycologia **13**: 122. 1921.
*Poria Fuligo aurantiotingens* Ellis & Macbr. Bull. Lab. Nat. Hist. Univ. Iowa **3**: 191. 1896.

On dead wood, Porto Rico:—Mexico; Guadeloupe.

2. **Poria eupora** Karst. Not. Faun. Fl. Fenn. **9**: 360. 1868.

*Poria attenuata* (Peck) Cooke, Grevillea **14**: 110. 1886.

On dead wood, Porto Rico:—eastern United States; Europe.

An excellent collection of this species, typical in every respect, was made by Stevenson at Rio Piedras in 1916, *5587*.

3. **Poria heteromorpha** Murrill, Mycologia **12**: 92. 1920.

On rotten wood, Porto Rico:—Jamaica, Florida.

4. **Poria subcollapsa** Murrill, Mycologia **12**: 90. 1920.

On banana trash, Porto Rico:—Jamaica.

5. **Poria vincta** Berk. Ann. Mag. Nat. Hist. II. **9**: 196. 1852.

On dead wood, Santo Domingo:—tropical America.

10. **RIMBACHIA** Pat. Bull. Soc. Myc. Fr. **7**: 159. 1891.

1. **Rimbachia pezizoidea** (Speg.) Lloyd, Myc. Notes **5**: 817. 1919.

*Merulius pezizoideus* Speg. Bol. Acad. Ci. Cordoba **11**: 455. 1889.

On rotten wood, Porto Rico:—Brazil.

The type species, *R. paradoxa* Pat., is described as growing among moss and with a *superior* venose hymenium. I would judge that the plants in the collection I refer here (Johnston, *655*) have a *pendant* disk with an inferior hymenium and a dorsal or latero-dorsal stipe insertion, but the hymenium is merulioid and not radiate-venose as in *Campanella*. If the superior hymenium be established as a generic character of *Rimbachia* then *R. pezizoidea* is not co-generic in my opinion. Lloyd has stated that the plants are co-specific. It is probably at any rate a close relative of *Campanella cucullata* which has a radiate venose hymenium and is therefore classed in the *Agaricaceae* (see Lloyd's Myc. Notes, **58**: 815. 1919). Its merulioid hymenium would suggest the *Polyporaceae* for Johnstons plants and by stretching the generic limits of *Merulius* might be included there as was originally done by Spegazzini, or might be regarded as a transition from *Merulius* to *Laschia*.

11. **SOLENIA** Pers. Neues Mag. Bot. **1**: 116. 1794.

1. **Solenia anomala** (Pers.) Fuckel, Symb. Myc. App. **1**: 290. 1877.

*Peziza anomala* Pers. Obs. Myc. **1**: 29. 1796.

On dead twigs, Porto Rico:—temperate and tropical North America.

2. **Solenia candida** Pers. Neues Mag. Bot. **1**: 116. 1794.

On dead bamboo stems, Porto Rico:—temperate and tropical America; also in Europe.

I refer here a scanty collection made by J. R. Johnston, *1324*, in 1914.

12. **TRAMETES** Fries, Gen. Hym. 11. 1836.

1. **Trametes cirrifer** (Berk. & Curt.) comb. nov.

*Polyporus cirrhiferus* Berk. & Curt. Jour. Linn. Soc. **10**: 314. 1868.

On dead wood, Porto Rico:—Cuba.

*Trametes ocellatus* Berk. seems to be the same plant.

2. **Trametes cubensis** (Mont.) Sacc. Syll. Fung. **9**: 198. 1891.

*Polyporus cubensis* Mont. Ann. Sci. Nat. II. **8**: 364. 1837.

On dead wood, Porto Rico:—St. Vincent; Cuba.

3. **Trametes hydnoides** (Sw.) Fries, Epicr. Myc. 490. 1838.

*Boletus hydnoides* Sw. Prodr. 149. 1788.

On dead wood, Porto Rico; Mona Island; Culebra; St. Thomas:—tropical and subtropical America.

4. **Trametes malicola** Berk. & Curt. Jour. Acad. Phil. II. **3**: 209. 1856.

On dead wood, Porto Rico:—temperate North America; rarely in subtropical and tropical regions.

One collection is referred here from the Stevens collections, *9010*, and one, *704*, from Fink's collection in 1915.

5. **Trametes nivosa** (Berk.) Murrill, N. Am. Fl. **8**: 42. 1907.

*Polyporus nivosus* Berk. Jour. Bot. & Kew Misc. **8**: 196. 1856.

On dead wood, Porto Rico:—continental South America; perhaps also on the North American continent.

I refer here a single collection taken from fence posts by Earle in 1922 (unnumbered). The specimen was compared at the Lloyd Museum following its recognition by Mr. Lloyd. I do not include specimens on cane stalks at New York determined by Murrill and apparently the basis of previous records of this species from the region.

6. **Trametes rigida** Berk. & Mont. Ann. Sci. Nat. III. **11**: 240. 1849.

*Polystictus rigens* Sacc. & Cub. in Sacc. Syll. Fung. **6**: 274. 1888.

On dead wood, Porto Rico; St. Thomas:—continental America.

The plant is a better *Polyporus* (*Polystictus*) than *Trametes*.

7. **Trametes serpens** Fries, Hym. Eur. 586. 1874.

On dead wood, Porto Rico; St. Thomas:—tropical and subtropical America.

Murrill considers the European *T. serpens* to be different from the American plant and for the latter has proposed the name *Trametes subserpens* Murrill (Mycologia **12**: 108. 1920).

A collection by Stevens, *8988*, in 1915 and one by Seaver and Chardon, *296*, in 1923 are referred here.

8. **Trametes submurina** Murrill, N. Am. Fl. **9**: 43. 1907.

*Polyporus submurinus* (Murrill) Lloyd, Syn. Apus Genus Polyporus **307**. 1915.

On rotten wood, Porto Rico:—St. Jan; Cuba; Jamaica.

Doubtful and Excluded Species.

A number of species often referred to *Trametes* will be found listed here under *Polyporus*.

## Family 6. **AGARICACEAE.**

### 1. **AGARICUS** L. Sp. Pl. 1171. 1753.

1. **Agaricus Johnstonii** Murrill, Mycologia **10**: 75. 1918.

On humus in woods, Porto Rico:—endemic.

### 2. **COLLYBIA** Quél. Champ. Jura Vosg. 56. 1872.

1. **Collybia tenuipes** (Schw.) Sacc. Syll. Fung. **5**: 213. 1887.

*Agaricus tenuipes* Schw. Trans. Am. Phil. Soc. II. **4**: 147. 1822.

On dead wood, Porto Rico:—West Indies; continental North and South America.

3. **COPRINUS** Pers. Tent. Disp. Fung. 62. 1797.

1. **Coprinus armillaris** Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 28. 1857.

On the ground, St. Thomas:—endemic.

2. **Coprinus plicatilis** Fries, Epicr. Myc. 252. 1838.

Apparently on the ground, Porto Rico:—cosmopolitan.

A collection by Seaver and Chardon in 1923 has the peculiar compressed citron-shaped spores of this species.

4. **CORTINARIUS** Fries, Epicr. Myc. 255. 1838.

1. **Cortinarius Sintenisii** P. Henn. Engl. Jahrb. **17**: 498. 1893.

On trunks, Porto Rico:—endemic.

5. **CREPIDOTUS** (Fries) Quél. Champ. Jura Vosg. 106. 1872.

1. **Crepidotus fumosifolius** Murrill, Mycologia **5**: 31. 1913.

On dead log, Porto Rico:—West Indies; continental America.

6. **FLAMMULA** Quél. Champ. Jura Vosg. 97. 1872.

1. **Flammula Earlei** Murrill, Mycologia **5**: 36. 1913.

*Gymnopilus Earlei* Murrill, Mycologia **5**: 22. 1913.

On cocoanut logs, Porto Rico:—Jamaica.

7. **GALERA** (Fries) Quél. Champ. Jura Vosg. 103. 1872.

1. **Galera macromastes** (Fries) Sacc. Syll. Fung. **5**: 860. 1887.

*Agaricus macromastes* Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 226. 1851.

Reported from St. Thomas:—endemic.

2. **Galera tenera** (Schaeff.) Quél. Champ. Jura Vosg. 104. 1872.

*Agaricus tener* Schaeff. Fung. Bavar. **4**: ind. 33. 1774.

On lawns and manured pastures, Porto Rico:—Cuba; continental North America; Europe.

8. **HELIOMYCES** Lév. Ann. Sci. Nat. III. **2**: 177. 1844.

1. **Heliomyces subavellaneus** Murrill, N. Am. Fl. **9**: 248. 1915.

On mossy log, Porto Rico:—British Honduras.

9. **LENTINUS** Fries, Syst. Orbis Veg. 77. 1825.

1. **Lentinus chrysopeplus** Berk. & Curt. Jour. Linn. Soc. **10**: 301. 1868.

On dead wood, Porto Rico:—temperate and tropical North America; perhaps in South America.

A collection of three small sporophores was made by Seaver and Chardon, *267*, in 1923, and another by Earle, date not known. The generic relationships of the species are in doubt. It has been referred to *Tricholoma*, *Omphalia*, and *Collybia*. The appearance is that of *Flammula*.

2. **Lentinus crinitus** (L.) Fries, Syst. Orbis Veg. 77. 1825.

*Agaricus crinitus* L. Sp. Pl. ed. *2*. 1644. 1763.

On old logs, Mona Island; Porto Rico; St. Thomas:—Jamaica.

3. **Lentinus detonsus** Fries, Nov. Symb. Myc. 22. 1851.

*Lentinula detonsa* (Fries) Murrill, Mycologia **3**: 28. 1911.

On dead wood, Porto Rico:—West Indies; Costa Rica; continental North America.

4. **Lentinus echinulatus** (Murrill) comb. nov.

*Crinipellis echinulata* Murrill, N. Am. Fl. **9**: 288. 1915.

On dead herbaceous stems, Porto Rico:—Mexico.

Specimens collected by Seaver and Chardon in 1923 differ from Murrill's type collection so slightly that they can well be referred here.

5. **Lentinus hirtus** (Fries) Murrill, Mycologia **3**: 29. 1911.

*Agaricus* (*Pleurotus*) *hirtus* Fries, Linnaea **5**: 508. 1830.

On dead wood, Porto Rico; St. Thomas:—tropical regions of the world.

6. **Lentinus lepideus** Fries, Syst. Orbis Veg. 78. 1825.

*Lentodium squamosum* (Schaeff.) Murrill, Mycologia **3**: 27. 1911.

On timbers and logs, Porto Rico:—throughout temperate and tropical America; Europe; Asia.

7. **Lentinus scyphoides** Pat. Bull. Soc. Myc. Fr. **15**: 195. 1899.

On dead branches on the ground, Porto Rico:—Guadeloupe.

8. **Lentinus strigellus** Berk. & Curt. Jour. Linn. Soc. **10**: 308. 1868.

On dead wood, Porto Rico:—tropical America.

9. **Lentinus strigosus** (Schw.) Fries, Syst. Orbis Veg. 77. 1825.

*Agaricus strigosus* Schw. Schr. Nat. Ges. Leipzig **1**: 89. 1822.

On old logs and stumps, Porto Rico; Vieques:—cosmopolitan.

10. **Lentinus subocyphoides** Murrill, Mycologia **3**: 34. 1911.

On dead sticks in dense woods, Porto Rico:—Jamaica.

11. **Lentinus velutinus** Fries, Linnaea **5**: 510. 1830.

On wood, Porto Rico; St. Thomas:—Cuba; continental North and South America.

10. **LEPIOTA** P. Browne; S. F. Gray, Nat. Arr. Brit. Pl. **1**: 601. 1821.

1. **Lepiota cepaestipes** (Sow.) Quél. Champ. Jura Vosg. 35. 1872.

*Agaricus cepaestipes* Sow. Engl. Fungi *Pl. 2.* 1795.

On rich ground, Porto Rico:—cosmopolitan.

2. **Lepiota cretacea** (Bull.) Morgan, Jour. Myc. **13**: 3. 1907.

*Agaricus cretaceus* Bull. Herb. Fr. *pl. 374.* 1787.

On rich ground, Porto Rico:—cosmopolitan.

3. **Lepiota Morgani** (Peck) Sacc. Syll. Fung. **5**: 31. 1887.

*Agaricus Morgani* Peck, Bot. Gaz. **4**: 137. 1879.

*Chlorophyllum Molybdites* Massee, Kew Bull. **1898**: 136. 1898.

On the ground, Porto Rico:—continental North and South America; West Indies.

4. **Lepiota rubrotincta** Peck, Ann. Rep. N. Y. State Mus. **44**: 179. 1892.
On the ground, Porto Rico:—continental North America.

11. **MARASMIUS** Fries, Gen. Hymen. 9. 1836.

1. **Marasmius Berteroi** (Lév.) Murrill, N. Am. Fl. **9**: 267. 1915.
*Heliomyces Berteroi* Lév. Ann. Sci. Nat. III. **2**: 177. 1844.
On trunks of trees, Porto Rico:—tropical North America.

2. **Marasmius borinquensis** Stevenson, Jour. Dept. Agr. Porto Rico **1**: 218. 1917.
On cane, Porto Rico:—endemic.

3. **Marasmius cinereialbus** Murrill, N. Am. Fl. **9**: 264. 1915.
In leaf mould, Porto Rico:—endemic.

4. **Marasmius Hiorami** Murrill, N. Am. Fl. **9**: 256. 1915.
On dead leaves and sticks in woods, Porto Rico:—endemic.

5. **Marasmius Johnstonii** Murrill, N. Am. Fl. **9**: 269. 1915.
On fallen dead leaves, Porto Rico:—endemic.

6. **Marasmius obsoletus** Murrill, N. Am. Fl. **9**: 265. 1915.
On dead wood, Porto Rico:—endemic.

7. **Marasmius pallescens** Murrill, N. Am. Fl. **9**: 261. 1915.
On leaves and sticks, Porto Rico:—endemic.

8. **Marasmius paucifolius** Murrill, N. Am. Fl. **9**: 262. 1915.
On dead leaves, Porto Rico:—endemic.

9. **Marasmius Peckii** Murrill, N. Am. Fl. **9**: 254. 1915.
On dead leaves, Porto Rico:—British Honduras.

10. **Marasmius portoricensis** Murrill, N. Am. Fl. **9**: 262. 1915.
On leaf mould, Porto Rico:—endemic.

11. **Marasmius Sacchari** Walker, Centr. Bakt. Parasit. Infekt. **2**: 44. 1896.
On living sugar cane, Porto Rico:—Java.

12. **Marasmius sarmentosus** Berk. Lond. Jour. Bot. **5**: 2. 1846.
*Polymarasmius sarmentosus* (Berk.) Murrill, N. Am. Fl. **9**: 286. 1915.
On dead wood, and leaves, Porto Rico:—Jamaica; Cuba; Guadeloupe; continental South America.

13. **Marasmius synodicus** (Kunze) Fries, Epicr. Myc. 381. 1838.
*Agaricus* (*Collybia*) *synodicus* Kunze; Fries, Linnaea **5**: 507. 1830.
On dead sticks, leaf stalks, grass, Porto Rico:—Cuba; Jamaica; Guadeloupe; continental South America.

14. **Marasmius Wilsonii** Murrill, N. Am. Fl. **9**: 261. 1915.

On fallen dead leaves, Porto Rico:—endemic.

12. **NAUCORIA** (Fries) Quél. Champ. Jura Vosg. 99. 1872.

1. **Naucoria papularis** (Fries) Sacc. Syll. Fung. **5**: 856. 1887.

*Agaricus papularis* Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 225. 1851.

Described from St. Thomas:—endemic.

13. **OMPHALIA** (Fries) S. F. Gray, Nat. Arr. Brit. Pl. **1**: 611. 1821.

1. **Omphalia euspeirea** (Berk. & Curt.) comb. nov.

*Agaricus* (*Mycena*) *euspeireus* Berk. & Curt. Jour. Linn. Soc. **10**: 285. 1868.

On decaying logs in woods, Porto Rico:—Cuba; Jamaica; continental South America.

2. **Omphalia lapidescens** (Horan.) Cohn & Schröt. Abh. Nat. Ver. Hamb. **11**: 15. 1891.

Reported from the Sintenis collection, Porto Rico:—Europe.
This species, in Europe, grows from a sclerotium, and only the sclerotial stage is said to be represented in the Sintenis collection, so that the occurrence of the species in this region is open to question.

14. **PANAEOLUS** Quél. Champ. Jura Vosg. 121. 1872.

1. **Panaeolus campanulatus** (L.) Quél. Jura Vosg. 122. 1872.

*Agaricus campanulatus* L. Sp. Pl. 1175. 1753.
*Campanularius campanulatus* (L.) Earle, Bull. N. Y. Bot. Gard. **5**: 434. 1909.

On manure and manured ground, Porto Rico:—probably cosmopolitan.

2. **Panaeolus solidipes** (Peck) Sacc. Syll. Fung. **5**: 1123. 1887.

*Agaricus solidipes* Peck, Ann. Rep. N. Y. State Cab. **23**: 101. 1872.
*Campanularius solidipes* (Peck) Murrill, Mycologia **10**: 31. 1918.

On horse manure, Porto Rico:—Cuba; Jamaica; continental North America.

15. **PANUS** Fries, Epicr. Myc. 396. 1838.

1. **Panus concavus** Berk. Ann. Mag. Nat. Hist. II. **9**: 194. 1852.

*Lentodiellum concavum* (Berk.) Murrill, Mycologia **7**: 216. 1915.

On dead wood, Porto Rico:—tropical America.

2. **Panus eugrammus** (Mont.) Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 40. 1851.

*Agaricus* (*Pleurotus*) *eugrammus* Mont. Ann. Sci. Nat. II. **8**: 366. 1837.

On dead wood, Porto Rico:—tropical America.
The species has been variously named in *Pleurotus*, *Panus*, and *Lentinus*.

3. **Panus rudis** Fries, Epicr. Myc. 398. 1838.

*Lentinus Lecomtei* Fries, Syst. Orbis Veg. 77. 1825.

On dead wood, Porto Rico:—continental North America.

16. **PILOSACE** Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 25. 1851.

1. **Pilosace tricholepis** (Fries) Sacc. Syll. Fung. **5**: 1010. 1887.
*Agaricus tricholepis* Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 25. 1855.
Described from St. Thomas:—endemic.

17. **PLICATURA** Peck, Ann. Rep. N. Y. State Mus. **24**: 75. 1872.

1. **Plicatura obliqua** (Berk. & Curt.) Murrill, Mycologia **3**: 25. 1911.
*Marasmius obliquus* Berk. & Curt. Jour. Linn. Soc. **10**: 299. 1868.
On dead wood, Porto Rico:—West Indies; continental South America.

18. **PSATHYRA** Fries, Hymen. Eur. 304. 1874.

1. **Psathyra byssina** Murrill, Mycologia **10**: 33. 1918.
*Atylospora byssina* Murrill, Mycologia **10**: 20. 1918.
On dead wood, Porto Rico:—endemic.

19. **PSATHYRELLA** (Fries) Quél. Champ. Jura Vosg. 122. 1872.

1. **Psathyrella disseminatus** (Pers.) Quél. Champ. Jura Vosg. 123. 1872.
*Psathyrella minutula* (Schaeff.) Murrill, Mycologia **10**: 26. 1918.
On ground or on rotten wood, Porto Rico:—West Indies; continental North America; Europe.

2. **Psathyrella Stevensonii** Murrill, Mycologia **10**: 28. 1918.

On garden soil, Porto Rico:—endemic.

20. **SCHIZOPHYLLUM** Fries, Obs. Myc. **1**: 103. 1815.

1. **Schizophyllum Alneum** (L.) Schröt. Krypt.—Fl. Schles. **3**[1]: 553. 1889.
*Agaricus Alneus* L. Sp. Pl. *1176*. 1753.
*Schizophyllus communis* Fries, Obs. Myc. **1**: 103. 1815.
On dead wood, Porto Rico; St. Thomas; St. Croix; Culebra; Mona Island; St. Jan; Tortola:—cosmopolitan.

21. **SCYTINOTUS** P. Karst. Bidr. Finl. Nat. Folk **32**: 97. 1879.

1. **Scytinotus distantifolius** Murrill, N. Am. Fl. **9**: 239. 1915.
On dead sticks, Porto Rico:—endemic.

22. **STROPHARIA** (Fries) Quél. Champ. Jura Vosg. 110. 1872.

1. **Stropharia cubensis** Earle, Inf. An. Estac. Centr. Agron. Cuba **1**: 240. 1906.
On manure, Porto Rico:—Cuba.

23. **TRICHOLOMA** Quél. Champ. Jura Vosg. 38. 1872.

1. **Tricholoma dichropus** (Fries) Sacc. Syll. Fung. **5**: 117. 1887.
*Agaricus dichropus* Fries, Nova Acta Soc. Sci. Upsal. III. **1**: 22. 1851.
*Melanoleuca dichropus* (Fries) Murrill, Mycologia **3**: 193. 1911.
Described from St. Thomas:—endemic.
Dr. Murrill records all the available information concerning this plant in Mycologia **3**: 193–194. 1911.

## Tribe 2. GASTEROMYCETES.

Hymenium (basidial layer) covered, either indefinitely or at least until the spores are ready for distribution.

This class includes all of those fungi commonly known as puffballs, stinkhorns, bird's nest fungi, etc., in all of which the hymenium is developed internally, though in a few, as the stinkhorns, it emerges from the covering (peridium) in time to elevate the mature spores for better distribution.

Plants soft and fleshy, usually enclosed in a gelatinous volva when young, this remaining as a cup at the base of the mature plant; spore-bearing mass deliquescent and mucilaginous, often foetid. Order 1. PHALLALES.

Plants small and cup-shaped or urn-shaped, opening at the top and containing seed-like bodies. Order 2. NIDULARIALES.

Plants not entirely as above.

Ripe plant dehiscing at maturity and enclosing a mass of dusty spores, often mixed with capillitial threads; terrestrial or wood-inhabiting. Order 3. LYCOPERDALES.

Ripe plants not as above; subterranean fungi; indehiscent; no capillitium present. Order 4. HYMENOGASTRALES.

### Order 1. PHALLALES.

Plants latticed or irregularly branched, sessile or stalked; gleba on the internal faces of the spore-bearing portion. Fam. 1. CLATHRACEAE.

Plants tubular or cylindric, capitate, the gleba external or becoming so. Fam. 2. PHALLACEAE.

### Family 1. Clathraceae.

1. **CLATHRUS** (Mich.) L. Sp. Pl. 1179. 1753.

1. **Clathrus cancellatus** L. Sp. Pl. 1179. 1753.

On the ground, Porto Rico:—subtropical North America; southern Europe; northern Africa; rare.

The species was reported from the Sintenis collection and was collected by Whetzel and Kern in 1924, the latter specimen determined by Lloyd.

3. **Clathrus crispus** Turpin, Dict. Sci. Nat. Atlas Veg. Acotyl. *pl. 49.* 1821.

On the ground, Porto Rico, Santo Domingo:—tropical America.

2. **LATERNEA** Turpin, Dict. Sci. Nat. **25**: 248. 1822.

1. **Laternea columnata** Nees & Henry, Syst. Pilze 13. 1858.

Reported from the Sintenis collection but not otherwise known; Porto Rico:—North and South America.

2. **Laternea triscapa** Turpin, Dict. Sci. Nat. **25**: 248. 1822.

On garden soil, Porto Rico:—Santo Domingo; Cuba; Java.

3. **LYSURUS** Fries, Syst. Myc. **2**: 285. 1823.

1. **Lysurus borealis** (Burt) Lloyd, Myc. Notes **1**: 183. 1904.

*Anthurus borealis* Burt, Mem. Boston Soc. Nat. Hist. **3**: 504. 1894.

On sandy soil, Porto Rico:—continental North America and Europe. Collected by Margaret S. Brown, *5911*, in 1922.

## Family 2. **PHALLACEAE.**

Two genera are known from the region, *Dictyophora* and *Mutinus*, the former with a distinct pileus on which the spore mass is produced, the latter a simple hollow stem with the spore mass on the upper part.

### 1. **DICTYOPHORA** Desv. Jour. de Bot. **2**: 92. 1809.

1. **Dictyophora indusiatus** (Vent.) comb. nov.

*Phallus indusiatus* Vent. Mem. Inst. Nat. Sci. Arts, Math. Phys. **6**: 520. 1798.

*Dictyophora phalloidea* Desv. Jour. de Bot. **2**: 92. 1809.

On soil, Porto Rico:—widely distributed.

### 2. **MUTINUS** Fries, Summa Veg. Scand. 434. 1849.

1. **Mutinus caninus** (Huds.) Fries, Summa Veg. Scand. 434. 1849.

*Phallus caninus* Huds. Fl. Angl. 630. 1798.

On the ground, Porto Rico:—continental America; Europe.

## Order 2. **NIDULARIALES.**

The order contains a single family, Nidulariaceae.

## Family 1. **NIDULARIACEAE.**

But a single genus, *Cyathus*, has been reported from the region. *Nidularia* is the only other genus with a distribution that would render it likely that it might be found. *Nidularia* is easily separated from *Cyathus* in that the cups are globose rather than urn-shaped, and the peridioles (seed-like bodies within the cups) are not attached by cords (funiculi) to the wall of the cup as in *Cyathus*.

### 1. **CYATHUS** Heller, Hist. Stirp. Helv. **3**: 127. 1768.

1. **Cyathus costatus** Lloyd, sp. nov.

On manure, Porto Rico:—endemic.

The species is to be published by Lloyd in Mycological Notes, from Fink's collections in 1915–16.

2. **Cyathus Earlei** Lloyd, The Nidulariaceae 26. 1906.

On dead wood, Porto Rico:—Cuba; Hawaii.

3. **Cyathus fimicola** Lloyd, sp. nov.

On manure, Porto Rico:—endemic.

The species is to be described by Lloyd in Mycological Notes, from Fink's collections in 1915–16.

4. **Cyathus Hookeri** Berk. in Hooker's Jour. Bot. **6**: 204. 1854.

On the ground, Porto Rico:—India.

The species was determined by Lloyd from Fink's collections in 1915–16. I believe there are other stations represented in the Lloyd Museum but I did not make note of them.

5. **Cyathus microsporus** Tul. Ann. Sci. Nat. III. **1**: 73. 1844.

On dead wood, Porto Rico:—tropical America.

Among others, a collection, *9050*, by Stevens in 1915, and one, *659*, by Seaver and Chardon in 1923, are referred here after comparisons in the Lloyd Museum.

6. **Cyathus Montagnei** Tul. Ann. Sci. Nat. III. **1**: 70. 1844.

On the ground, Porto Rico:—Brazil.
The plants were determined by Lloyd from Fink's collections in 1915–16, *708*.

7. **Cyathus pallidus** Berk. & Curt. Jour. Linn. Soc. **10**: 340. 1868.

On wood, Porto Rico:—Cuba.

8. **Cyathus Poeppigii** Tul. Ann. Sci. Nat. III. **1**: 77. 1844.

On the ground and on wood, Porto Rico:—Cuba; South America.

9. **Cyathus stercoreus** (Schw.) De-Toni in Sacc. Syll. Fung. **7**: 40. 1888.

*Nidularia stercorea* Schw. Trans. Am. Phil. Soc. II. **4**: 253. 1832.

On the ground and on wood, Porto Rico:—Europe; continental North America; Africa.

10. **Cyathus triplex** Lloyd, The Nidulariaceae 23. 1906.

On sticks, St. Thomas:—Mauritius.

11. **Cyathus striatus** (Huds.) Hoffm. Veg. Crypt. **2**: 33. 1790.

*Peziza striata* Huds. Fl. Angl. 634. 1778.

On the ground and on wood, Porto Rico:—Europe; continental North America; Africa.

## Order 3. LYCOPERDALES.

| | |
|---|---|
| Capillitium none; plants very small, wood-inhabiting, more or less gelatinous. | Fam. 1. Sphaerobolaceae. |
| Capillitium none; plants ground-inhabiting; not gelatinous. | Fam. 2. Sclerodermaceae. |
| Capillitium present, mixed with the spores; mostly ground-inhabiting; not at all gelatinous. | Fam. 3. Lycoperdaceae. |

### Family 1. SPHAEROBOLACEAE.

The family contains a single genus *Sphaerobolus*, of uncertain affinities.

#### 1. SPHAEROBOLUS Tode, Fungi Meckl. **1**: 43. 1790.

1. **Sphaerobolus stellatus** Tode, Fungi Meckl. **1**: 43. 1790.

On cane trash and on rotten wood, Porto Rico:—widely distributed.

### Family 2. SCLERODERMACEAE.

A single genus *Arachnion* has been reported from the region. The interior is ash-colored and the plants less than 1 cm. diameter. The genus *Scleroderma* also occurs, but the specific identity of the collections has not been determined. In *Scleroderma* the interior is dark-colored from a very early stage.

#### 1. ARACHNION Schw. Schr. Nat. Ges. Leipzig **1**: 59. 1822.

1. **Arachnion album** Schw. Schr. Nat. Ges. Leipzig **1**: 59. 1822.

On the ground, Porto Rico:—continental North and South America.

## Family 3. **LYCOPERDACEAE.**

1. **CATASTOMA** Morgan, Jour. Cin. Soc. Nat. Hist. **14**: 142. 1892.

1. **Catastoma anomalum** (Cooke & Massee) Lloyd, Lycoperd. Austral. 27. 1905.

*Bovista anomalum* Cooke & Massee, Grevillea **18**: 6. 1889.

On the ground, Porto Rico, Santo Domingo; Australia.
This rare species, known hitherto only from Australia, was collected by N. L. and E. G. Britton in 1924, *8021*. The species was determined for me by Lloyd who regards it as the only *Catastoma* with a definite protruding mouth, resembling the mouth of a *Geaster*.

2. **Catastoma circumscissum** (Berk. & Curt.) Lloyd, Myc. Notes **1**: 78. 1901.

*Bovista circumscissa* Berk. & Curt. Grevillea **2**: 50. 1873.

On lawn, Porto Rico:—temperate and tropical regions.
A collection by Earle in 1921 has the spores 4–6 $\mu$ diameter and slightly echinulate, agreeing with those of this species rather than with *C. subterraneum*, which Lloyd reports as with spores 6–8 $\mu$ diameter.

2. **DIPLOCYSTIS** Berk. & Curt. Jour. Linn. Soc. **10**: 344. 1868.

1. **Diplocystis Wrightii** Berk. & Curt. Jour. Linn. Soc. **10**: 344. 1868.

On the ground, Porto Rico; St. Croix:—Cuba; Bahamas.
The remains of this rather common species appear as a coarse honeycomb-like mass several inches in extent on dry ground.

3. **GEASTER** Micheli, Nov. Pl. Gen. 220. 1729.

1. **Geaster Dybowski** Pat. Bull. Soc. Myc. Fr. **18**: 300. 1902.

On the ground, Porto Rico:—Oubangui.
The species was determined by Lloyd from Fink's collections in 1915–16.

2. **Geaster Lloydii** Bres. & Pat. in Lloyd Myc. Notes **1**: 50. 1901.

On root of upturned tree, Porto Rico:—Samoa.
The plants were determined by Lloyd from Fink's collections in 1915–16, *520*.

3. **Geaster Hariotii** Lloyd, Myc. Notes **2**: 311. 1907.

On the ground, St. Thomas:—South America.

4. **Geaster mirabilis** Mont. Ann. Sci. Nat. IV. **3**: 139. 1855.

On the ground, Porto Rico:—continental North America; Ceylon; Africa.

5. **Geaster saccatus** Fries, Syst. Myc. **3**: 16. 1829.

On the ground, Porto Rico:—cosmopolitan.

6. **Geaster striatulus** Kalchbr. Grevillea **9**: 3. 1880.

On the ground in pastures, Porto Rico:—Florida.
After microscopic comparisons at the Lloyd museum, I refer here with considerable certainty a collection by Earle in 1922. The mouth of the inner peridium is beautifully sulcate. Spores 5–6 $\mu$.

7. **Geaster subiculosum** Cooke & Massee, Grevillea **15**: 97. 1887.

On the ground, Porto Rico:—Australia.
Four collections made by Fink, *1271*, in 1915–16 are referred here by Lloyd, though the species is not listed in his monograph, The Geastrae.

8. **Geaster velutinus** Morgan, Jour. Cinn. Soc. Nat. Hist. **18**: 38. 1895.

On the ground, Porto Rico:—continental North America.

4. **LYCOGALOPSIS** Fischer, Ber. Deuts. Bot. Ges. **4**: 192. 1886.

1. **Lycogalopsis subiculosum** Lloyd, sp. nov.

On dead wood, Porto Rico.
The plants were determined by Lloyd from Fink's collections in 1915–16.

5. **LYCOPERDON** (Tourn.) L. Sp. Pl. 1183. 1753.

1. **Lycoperdon albinum** Cooke, Jour. Roy. Mic. Soc. 1887: 723.

On the ground, Porto Rico:—Brazil.
Specimens of this species were determined by Lloyd.

2. **Lycoperdon cruciatum** Rostk.; Sturm, Deuts. Fl. Pilze **5**: 19. 1844.

On soil and on rotten wood, Porto Rico:—Europe; continental North America.

3. **Lycoperdon fimicola** Lloyd, sp. nov.

On manure, Porto Rico:—endemic.
The species is to be described by Lloyd in Mycological Notes, from specimens in Fink's collections of 1915–16.

4. **Lycoperdon fuligineum** Berk. & Curt. Jour. Linn. Soc. **10**: 345. 1868.

On very rotten wood, Porto Rico:—Cuba; Florida; Brazil.
A collection made by Earle, *293*, in 1920 is referred here after comparisons in the Lloyd Museum. Also one by Britton and Cowell, *3125*, collected in 1914.

5. **Lycoperdon pyriforme** Schaeff. Ic. Myc. *pl. 185*. Ind. 128. 1774.

On the ground, Porto Rico:—cosmopolitan.

6. **Lycoperdon pusillum** Batsch, Elench. Fung. **2**: 123. 1789.

On humus and cane trash, Porto Rico:—cosmopolitan.

7. **Lycoperden Wrightii** Berk. & Curt. Grevillea **2**: 50, 1873.

On the ground, Porto Rico:—continental North America.
A collection by Stevenson, *7014*, in 1915.

6. **TYLOSTOMA** Pers. Syn. Fung. 139. 1801.

1. **Tylostoma Berkeleyi** Lloyd, The Tylostomeae 25. 1906.

On ground, Porto Rico:—subtropical America.
A single collection made by E. G. & N. L. Britton in 1924, *8018*, is referred here with some apprehension after comparisons in the Lloyd Museum.

2. **Tylostoma exasperatum** Mont. Pl. Cell. Cuba 317. 1856.

On dead wood, Porto Rico:—Cuba, Ceylon.

3. **Tylostoma volvulatum** Borsch; Sorokin, Rev. Myc. **12**: 50. 1890.

On the ground, Porto Rico:—Africa.

The species is admitted on the determination of Coker. It was collected by Seaver and Chardon, *142*, in 1923.

## ADDENDA.

**Amphinectria portoricensis** Speg. Bol. Acad. Nac. Ci. Cordoba **26**: 346. 1924.
On *Comocladia glabra* (Schultes) Spreng., Porto Rico:—endemic.
(Insert before *Calonectria* page 41.)

**Coniothyrium concentricum** (Desm.) Sacc. Michelia **1**: 204. 1884.
*Phoma concentrica* Desm. Ann. Sci. Nat. II **13**: 189. 1840
On *Yucca aloifolia* L.; Porto Rico:—Europe; West Indies.

**Perisporium Bromeliae** Stevens, Trans. Ill. Acad. Sci. **10**: 168. 1917.
On *Bromelia Pinguin* L. Porto Rico:—endemic.
(Insert after *Perisporina*, page 38 )

In addition to the slime-molds listed the following additional species have been collected by Mr. Robert Hagelstein during January and February, 1926: **Comatricha irregularis** Rex; **Cribraria intricata** Schrad.; **Cribraria violacea** Rex; **Diderma hemisphericum** (Bull.) Horne; **Lamproderma arcyrionema** Rost.; **Lamproderma violaceum** (Fries) Rost.; **Ophiotheca Wrightii** Berk. & Curt.; **Physarum nutans** Pers.; **Physarum polycephalum** Schw.; **Physarum reniforme** (Mass.) Lister; **Physarum sessile** Brandza; **Stemonitis hyperopta** Meyl.

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OF

# Porto Rico and the Virgin Islands

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**Supplement to Mycology**

*Fred J. Seaver, Carlos E. Chardon, Rafael A. Toro, and Frank D. Kern*

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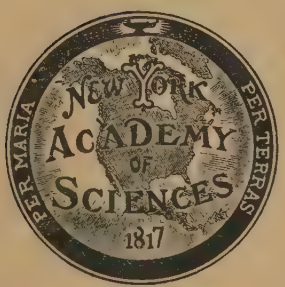
*Nathaniel L. Gardner*

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# SUPPLEMENT TO MYCOLOGY

Fred J. Seaver, Carlos E. Chardon and Rafael A. Toro.

Collections of fungi made and studied since the publication of Part 1 of this volume in December 1926, have added knowledge of many species, here enumerated. Studies by the authors, and by coöperating students, have determined modifications in classification and nomenclature. A Bibliography of the Mycology and a supplementary Host Index are appended. The total number of Fungi, including Myxomycetes, now known to occur in Porto Rico and the Virgin Islands, is, approximately, 1610.

Page 12, add **Albugo minor** (Speg.) Cif. Nuo. Gior. Bot. Ital. n. s. **35:** 132. 1928.

*Cystopus convolvulacearum minor* Speg. Anal. Soc. Ci. Argentina **17:** 128. 1884.

On *Ipomoea Batatas* (L.) Lam., Porto Rico:—continental America.

Page 13, Genus **RHYSOTHECA,** place at end of **PSEUDOPERONOSPORA,** and after **RHYSOTHECA,** add Family 3. **PYTHIACEAE.**

1. **PHYTOPHTHORA** De Bary, Jour. Roy. Agr. Soc. Engl. II. **12:** 240. 1876.

Add **Phytophthora Capsici** Leonian, Phytopath. **12:** 401. 1922.

On seedlings of *Capsicum frutescens* L., Porto Rico:—continental America.

**Phytophthora Cinnamomi** Rands, Dept. Landb. Mjo. Handel. Meded. **54:** 1–53. 1922.

On seedlings of *Persea Persea* (L.) Cockerell, Portó Rico:—endemic.

**Phytophthora citrophthora** (Sm. & Sm.) Leonian, Am. Jour. Bot. **12:** 444. 1925.

*Pythiacystis citrophthora* Sm. & Sm. Bot. Gaz. **42:** 215. 1906.

Causing fruit decays on *Citrus grandis* (L.) Osbeck and *Citrus Limonum* Risso. Isolated in the laboratory of Plant Pathology, at the College of Agriculture, by Jaime R. Guiscafré, Porto Rico:—continental America.

**Phytophthora palmivora** Butler, Mém. Dept. Agric. India. Bot. Ser. **1:** 1. 1907.

*Pythium palmivorum* Butler, loc. cit. 1907.

*Phytophthora Faberi* Maubl. Agr. Prot. Pays Chauds **9:** 314. 1909.

On *Cocos nucifera* L., *Sabal causiarium* (Cook) Beccari, *Antirrhinum majus* L., *Gossypium barbadense* L., Porto Rico:—India; West Indies.

**Phytophthora parasitica Nicotianae** Tucker, Missouri Agr. Exp. Sta. Res. Bull. **153:** 173. 1931.

*Phytophthora Nicotianae* Breda de Haan, Med. Lans. Planter Java **15:** 107. 1896.

*Phytophthora Tabaci* Saw. Rept. Dept. Agr. Res. Inst. Formosa **27:** 73. 1927.

Causing black-shank of *Nicotiana Tabacum* L., Porto Rico:—Florida; Sumatra.

For **Phytophthora terrestris** Sherb., substitute **Phytophthora parasitica** Dast. Mem. Dept. Agr. India Bot. Ser. V. **4**: 177. 1913. An older name.
Correct host: for *Capsicum annuum* L. read *Capsicum frutescens* L.

2. **PYTHIUM** Pring. Jahrb. Wiss. Bot. **1**: 304. 1858.

1. **Pythium aphanidermatum** (Edson) Fitzpatrick, Mycologia **15**: 166. 1923.
*Rheosporangium aphanidermatum* Edson, Jour. Agr. Res. **4**: 279. 1915.
*Pythium Butleri* Subramanian, Mém. Dept. Agr. India **10**: 181. 1919.
On *Carica Papaya* L., Porto Rico:—India.

2. **Pythium Debaryanum** Hesse, Inaugr. Dissert. Halle. 1874.
Causing damping-off of seedlings:—cosmopolitan.

3. **Pythium graminicolium** Subramanian, Agric. Res. Inst. Pusa Bull. 177. 1918.
*Pythium aphanidermatum* of Carpenter and of Bourne, not of Fitzpatrick.
On *Saccharum officinarum* L., Porto Rico:—Hawaii.

4. **Pythium ultimum** Trow, Ann. Bot. **15**: 269. 1901.
Causing damping-off of seedlings, Porto Rico:—continental America.

After **MUCORACEAE,** add 1. **MUCOR** Micheli, Nov. Pl. Gen. 215. 1729.

1. **Mucor hiemalis** Wehmer, Ann. Myc. **1**: 39. 1903.
On soils, Porto Rico:—Europe; continental America.

2. **Mucor mucedo** L. Sp. Pl. 1185. 1753.
On soils, Porto Rico:—Europe; continental America.

3. **Mucor racemosus** Fresenius, Beitr. Myk. 12. 1850.
On soils, Porto Rico:—Europe; continental America.

2. **ZYGORHYNCHUS** Nam. Ann. Myc. **8**: 153. 1910.

**Zygorhynchus Vuilleminii** Namyslowski, Ann. Myc. **8**: 153. 1910.
On soils, Porto Rico:—Europe; continental America.

Page 14, add, **Pilobolus Kleinii** Van Tiegh. Bull. Soc. Bot. Fr. **22**: 282. 1875.
On dung, Porto Rico:—also in Europe.

After **PILOBOLACEAE,** add Family 3. **CHAETOCLADIACEAE.**

1. **CUNNINGHAMELLA** Matr. Ann. Myc. **1**: 46. 1903.

**Cunninghamella albida** (Sacc.) Matruchot, Ann. Myc. **1**: 56. 1903.
*Oedocephalum albidum* Sacc. Syll. Fung. **28**: 48. 1886.
On coffee soils, Porto Rico.

**Cunninghamella elegans** Lendner, Bull. Herb. Boissier II. **7**: 250. 1907.
On coffee soils, Porto Rico:—continental America.

After **CHAETOCLADIACEAE,** add Family 4, **THAMNIDIACEAE.**

1. **THAMNIDIUM** Link, Berl. Mag. Nat. Freunde **3**: 31. 1809.

**Thamnidium elegans** Link, l. c. 1809.
Isolated from coffee soils Porto Rico:—Europe, United States.

Page 16, For **Saccharomyces ellipsoideus** Rees, read **Saccharomyces ellipsoideus tropicus** Lilien, Toal & Henreb. Beih. Tropenpfl. **24**: 1. 1917.

At end of **SACCHAROMYCETACEAE,** add Family 2. **ENDOMYCETACEAE.**

1. **ASHBYA** Guill. Rev. Gen. Bot. **40:** 474. 1928.

**Ashbya Gossypii** (Ash. & Now.) Guill. l. c. 1928.

*Nematospora Gossypii* Ash. & Now. Ann. Bot. **40:** 74. 1926.
*Ashbya Gossypii* Fragoso & Ciferri, Bol. Soc. Espan. Hist. Nat. **28:** 131. 1928.

On *Gossypium barbadense* L., Porto Rico:—Trinidad; Santo Domingo.

After **MYRIANGIACEAE,** add 2. **ELSINOE** Rac. Par. Alg. Fung. Java **1:** 14. 1900.

**Elsinoe Canavaliae** Rac. l. c. 1900.

On *Phaseolus lunatus* L., Porto Rico:—Cuba.

Page 17, **Aspergillus terreus** Thom, add habitat: soil.

For **Ceratocarpia Wrightii** (Berk. & Curt.) Toro, read **Myriangium Tunae** (Spreng.) Pet. Ann. Myc. **27:** 359. 1929. *Sphaeria Tunae* Spreng., an older name. Add synonym, *Stevensea Wrightii* (B. & C.) Trott.; Sacc. Syll. Fung. **24:** 261. 1926.

Add, **Penicillium implicatum** Biourge, La Cellule **33:** 278. 1923.
On coffee soils, Porto Rico:—Europe.

**Penicillium Steckii** Zaleski, Bol. Acad. Polonaise, Ser. B. **1927:** 469.
On coffee soils, Porto Rico.

At end of **PENICILLIUM** add 4. **SCOPULARIOPSIS** Bainier, Bull. Soc. Myc. Fr. **23:** 98. 1907.

**Scopulariopsis trigonospora** Emmons & Dodge, Mycologia **23:** 317. 1931.
This is the conidial stage of **Microascus trigonosporus** E. & D.
On unknown host, Porto Rico:—endemic.

Page 18, Before **MICROTHYRIACEAE,** insert family **POLYSTOMELLACEAE.**

1. **POLYSTOMELLA** Speg. Anal. Soc. Ci. Argentina **26:** 53. 1888.

**Polystomella Nectandrae** Toro, sp. nov.

Ascomata hypophylla majuscula atra crustacea tenuia ambitu irregulariter, minuteque papillulato-ostiolata, contextu prosenchymatico-radiante fere opacum distincto; loculi sparsi sub-discoidei ovatae v. elliptico-ovatae; asci obovati majusculi, tunica crassa leniter violascente vestiti, paraphysati, 8-spori; sporae ellipticae utrimque obtusiusculae, ad medium 1-septatae, constrictae, hyalinae.
In foliis vivis *Nectandrae Sintenisie* Mez, prope Ciales, Porto Rico:—leg. C. E. Chardon.

Spots none; ascomata hypophylla black, at margin radiate irregular, center black, ostiolate, .6–4 mm. in diameter; superficial mycelium none; loculi separate, somewhat ovate or elliptical ovate, 85–100 × 50–70 $\mu$; asci in a pallisade layer, obovate, sessil, obtuse and thick-walled above; thin and cuneiform at the base, violet tinted; 55 × 24 $\mu$, 8-spored; spores inordinate, 2-celled, hyaline at first, fuscous with age, slightly constricted, upper cell shorter, roundish, lower cell elongate, obtuse at both ends, 20–26 × 8-9 $\mu$; paraphyses filiform, longer than asci.

2. **RHAGADOLOBIUM** P. Henn. & Lind. Engler Bot. Jahrb. **23:** 287. 1897.

**Rhagadolobium Cucurbitacearum** (Rehm) Theiss. & Sydow, Ann. Myc. **12:** 275. 1914.

*Dothidella Cucurbitacearum* Rehm, Hedwigia **36:** 376. 1897.

On *Pepo moschata* (Duch.) Britton, Porto Rico:—Brazil, Venezuela.

Page 18, add before **MICROTHYRIACEAE** Family **TRICHOCOMACEAE**

1. **TRICHOCOMA** Jungh. Praem, Fl. Crypt. Jav. 9. 1838.

**Trichocoma paradoxum** Jungh. l. c.

On dead wood, Porto Rico:—also in Europe.

The specimen on which this report is based was determined by the late Dr. Roland Thaxter.

Page 19, For **Asterina Fawcetti** Ryan, read **Asterina colliculosa** Speg., an older name. Add distribution:—South America; Santo Domingo.

For **Asterina Melastomacearum** Ryan, read **Asterina Melastomatis** (Lév.) Arnaud, Les Astérinées **1**: 168. 1918. An older name.

For **Asterina passifloricola** Ryan, read **Asterina megalospora** Berk. & Curt. Jour. Linn. Soc. Bot. **10**: 363. 1898. Add synonym *Asterina Tacsoniae Passiflorae* Ryan. Add distribution:—North and South America.

Page 20, For **Asterina Racemosae** Ryan, read **Asterina Belluciae** P. Henn. Hedwigia **43**: 374. 1904. An older name. Add distribution:—Colombia.

*Asterina Tacsoniae* Pat. var. *Passiflorae* Ryan, is synonym of *Asterina megalospora* Berk. & Curt.

Page 21, For **Calothyrium Hippocratea** Ryan, read **Microthyrium Hippocratea** (Ryan) Toro, comb. nov.

For **Calothyrium Ingae** Ryan, read **Microthyrium Ingae** (Ryan) Toro, Jour. Dept. Agric. Porto Rico **10**[2]: 13. 1926.

Page 22, For **Calothyrium Psychotriae** Ryan, read **Microthyrium Psychotriae** (Ryan) Toro, Jour. Dept. Agric. Porto Rico **10**[2]: 13. 1926.

**Caudella Psidii** Ryan, add distribution: Santo Domingo; Costa Rica; Venezuela.

**Echidnodes microspora** (Chardon) Seaver & Toro, read **Lembosia microspora** Chardon, Mycologia **13**: 282. 1921. Add synonym, *Morenoella portoricensis* Speg.

Page 23, add **Lembosia diffusa** Winter, Hedwigia **24**: 30. 1885.
On *Miconia prasina* (Sw.) DC., Porto Rico:—continental South America.

Page 24, *Morenoella portoricensis* Speg., is synonym of **Lembosia microspora** (Chardón) Toro.

Page 25, For **Asteridiellina portoricensis** (Speg.) Seaver & Toro, read **Halbaniella portoricensis** (Speg.) Toro, comb. nov. **HALBANIELLA** Theiss. Ann. Myc. **14**: 430. 1916. An older generic name.

Sect. **MELIOLINEAE** Stevens, Ann. Myc. **25**: 405. 1927.

The genera **Amazonia** Theiss., **Meliolina** Stevens, **Irene** Theiss. & Sydow, **Irenopsis** Stevens and **Meliola** Fries, are considered in the light of the recent monograph of Stevens on the **MELIOLINEAE.**

Page 28, Transfer **AMAZONIA** Theiss. Ann. Myc. **11**: 499, 1913, from the **MICROTHYRIACEAE** to this family, and add:

**Amazonia Clusiae** (Stevens) Stevens, Ann. Myc. **25**: 415. 1927.

*Meliola Clusiae* Stevens, Ill. Biol. Monog. **2**: 52. 1916.

On *Clusia minor* L., Porto Rico:—endemic.

**Amazonia Tehoni** Toro, nom. nov.

*Meliola asterinoides* Tehon, Bot. Gaz. **67**: 503. 1919. Not Winter, Hedwigia **29**: 96. 1886.

On *Genipa americana* L., Porto Rico.

For **Appendiculella arecibensis** (Stevens) Toro, read **Irene larviformis** (P. Henn.) Stevens. Add distribution:—Central and South America.

For **Appendiculella calostroma** (Desm.) Höhn., read **Irene calostroma** (Desm.) Höhn. Ann. Myc. **16**: 213. 1918.

For **Appendiculella Calophylli** (Stevens) Toro, read **Irene Calophylli** Stevens. Add distribution:—Dominica.

For **Appendiculella Compositarum** (Earle) Toro, read **Irene sororcula** (Speg.) Stevens. Add distribution:—South America; Santo Domingo; Jamaica. Add synonym: *Irene sororcula portoricensis* (Stevens) Stevens. (*Appendiculella compositarum portoricensis* (Stevens) Seaver & Toro).

For **Appendiculella tuberculata** (Stevens) Toro, read **Irene tuberculata** (Stevens) Stevens.

Page 29, For **Dimeriopsis arthrostylidicola** Stevens, read **Dimerina arthrostylidicola** (Stevens) Clements & Shear, Gen. Fung. 250. 1931.

After **HYALODERMA** add 7a. **IRENINA** Stevens, Ann. Myc. **25**: 442. 1927.

*Irene* of authors not of Theiss. & Sydow. The species reported by Seaver & Toro under *Irene* Theiss. & Sydow are transferred to **Irenina** Stevens on the authority of Stevens (l. c.).

Page 30, 2. **Irenina cyclopoda** (Stevens) Stevens, add distribution:—British Guiana; Trinidad.

3. **Irenina glabra** (Berk. & Curt.) Stevens, add distribution:—South Africa; Brazil; Argentine.

4. **Irenina glabroides** (Stevens) Stevens, add distribution:—Central America; South America; Trinidad.

5. **Irenina hyptidicola** (Stevens) Stevens, add distribution: Costa Rica; Ecuador; Santo Domingo.

7. **Irenina Laguncullariae** (Earle) Stevens, add synonym: *Amazonia Laguncullariae* (Earle) Ryan, Mycologia **18**: 107. 1927. Add distribution:—Panama.

8. **Irenina longipoda** (Gaill.) Stevens, add distribution: Santo Domingo.

Add 10a **Irenina Podocarpi** (Doidge) Stevens, Ann. Myc. **25**: 447. 1927. *Meliola Podocarpi* Doidge, Trans. Roy. Soc. So. Africa **5**: 725. 1917.

On *Nageia coriacea* (L. C. Rich.) Kuntze (*Podocarpus coriaceus* L. C. Rich) Porto Rico:—Philippine; Africa.

Page 31, **Irene triloba** (Winter) Stevens, add distribution:—Hawaii.

**Meliola ambigua** Pat. & Gaill., add distribution:—Santo Domingo.

**Meliola amphitricha** Fries, is not this species but **Irene Araliae** (Sprengel) H. Sydow, Ann. Myc. **25**: 425. 1927. Strike Australia and Philippine Islands out of the distribution of this species.

**Meliola Andirae** Earle, add distribution:—Panama.

For **Meliola bayamonensis** Tehon, read **Irenopsis bayamonensis** (Tehon) Stevens.

**Meliola bicornis** Winter, add distribution:—Africa; Philippine Islands.

**Meliola bidentata** Cooke, add distribution:—South America; Dominica.

**Meliola Byrsonimae** Stevens, add distribution:—Panama.

Page 32, **Meliola capsicola** Stevens, add distribution:—Dominica.

For **Meliola chamaecristicola** Stevens, read **Irenopsis chamaecristicola** (Stevens) Stevens.

For **Meliola Chiococcae** Stevens, read **Irenopsis Chiococcae** (Stevens) Stevens.

**Meliola circinans** Earle, add distribution:—British Guiana.

**Meliola clavulata** Winter, add distribution:—South America.

**Meliola Clusiae** Stevens, see **Amazonia Clusiae**.

For **Meliola Comocladiae** Stevens, read **Irenopsis Comocladiae** (Stevens) Stevens. Add distribution:—Dominica.

For **Meliola compacta** Earle, read **Irenopsis compacta** (Earle) Stevens. Add synonyms: *Irenopsis conferta* (Tehon) Stevens; *Meliola conferta* Tehon. The host as referred by Stevens (Ann. Myc. **25:** 434. 1927), to the Compositae is an error, as *Rhacoma* is a genus of the Celastraceae.

**Meliola conferta** Tehon, see **Irenopsis compacta** (Earle) Stevens.

For **Meliola Cupaniae** Stevens, read **Irenopsis Cupaniae** (Stevens) Stevens.

Page 33, **Meliola Cyperi** Pat.; Gaill, substitute **Meliola argentina** Speg. Anal. Soc. Ci. Argentina **9:** 177. 1880. An older name. Add distribution:—Argentina.

**Meliola Dieffenbachiae** Stevens, add distribution:—Santo Domingo; South America.

**Meliola furcata** Lév., add distribution:—Central America; Cuba; South Africa; Ceylon; Dominica; United States.

**Meliola Gaillardiana** Stevens, see **Meliola Piperis** Earle.

**Meliola guareicola** Stevens, add distribution:—Dominica.

**Meliola Guignardi** Gaill., is not this species but **Irenopsis portoricensis** Stevens, Ann. Myc. **25:** 433. 1927. To this species can also be referred the specimen reported by Toro from Santo Domingo on this host. Strike out from the distribution, continental South America and substitute:—Santo Domingo.

Page 34, For **Meliola Hessii** Stevens, read **Meliola Sapindacearum** Speg. Rev. Argentina Hist. Nat. **1:** 29. 1891. An older name.

**Meliola Ipomoeae** Earle, a better name is **Meliola malacotricha** Speg. Anal. Soc. Ci. Argentina **26:** 59. 1888. Add distribution:—Africa; South America; Central America; Philippine.

**Meliola Lucumae** Stevens, add distribution:—Argentina.

**Meliola Magnoliae** Stevens, add distribution:—Florida.

For **Meliola Marcgraviae** Tehon, read **Irenina Marcgraviae** (Tehon) Stevens. Add distribution:—British Guiana; Costa Rica.

**Meliola mayaguesiana** Stevens, add distribution:—Ecuador; British Guiana.

For **Meliola Mayepeae** Stevens, read **Meliola mayepeaicola** Stevens, an error of printing.

**Meliola Merrillii** Sydow, add synonym *Meliola varia* Dodge, Trans. Roy. Soc. South Africa **5:** 738. 1917.

For **Meliola Miconiae** Stevens, read **Irenopsis Miconiae** (Stevens) Stevens. Add distribution:—Santo Domingo.

For **Meliola miconieicola** Stevens, read **Irenopsis miconiecola** (Stevens) Stevens.

Page 35, For **Meliola Molleriana** Winter, read **Irenopsis Molleriana** (Winter) Stevens. Add distribution:—South America; Santo Domingo.

For **Meliola Ocoteae** Stevens, read **Irenopsis Ocoteae** (Stevens) Stevens. Add distribution:—Dominica.

**Meliola ocoteicola** Stevens, add distribution:—Dominica.

**Meliola Panici** Earle, add distribution:—Africa; Philippines; Santo Domingo; Panama; Costa Rica; Colombia.

For **Meliola parathesicola** Stevens, read **Irenopsis parathesicola** (Stevens) Stevens.

**Meliola Paulliniae** Stevens, add distribution:—Panama.

**Meliola Piperis** Earle, add synonym *Meliola Gaillardiana* Stevens. Add distribution:—Santo Domingo; British Guiana.

Page 36, **Meliola praetervisa** Gaill., add distribution:—South America; Santo Domingo.

**Meliola Psychotriae** Earle, add distribution:—Africa; Santo Domingo; South America.

**Meliola pteridicola** Stevens, add distribution:—Central America.

For **Meliola rectangularis** Stevens, read **Irenopsis rectangularis** Stevens.

**Meliola Rudolphiae** Stevens, add distribution:—Colombia.

**Meliola Serjaniae** Stevens, add distribution:—Costa Rica.

For **Meliola Solani** Stevens, read **Irenopsis Solani** (Stevens) Stevens. Add synonym: *Irene Solani* (Stevens) Toro, Mycologia **19:** 73. 1927. Add distribution:—Santo Domingo; Central and South America.

Page 37, **Meliola Tecomae** Stevens, add distribution:—Dominica.

For **Meliola tenuissima** Stevens, read **Irenopsis tenuissima** (Stevens) Stevens. Add distribution:—Costa Rica; Santo Domingo.

For **Meliola tortuosa** Winter; Gaill., read **Irenopsis tortuosa** (Winter) Stevens. Add distribution:—Santo Domingo.

For **Meliola toruloidea** Stevens, read **Irenopsis toruloidea** (Stevens) Stevens. Add synonym: *Irene toruloidea* Stevens & Tehon, Mycologia **18:** 18. 1926. Add distribution:—Trinidad; Panama; Costa Rica.

For **Meliola Triumfettae** Stevens, read **Irenopsis coronata** (Speg.) Stevens. *Meliola coronata* Speg. Anal. Soc. Ci. Argentina **14:** 175. 1883. An older name. Add synonym: *Irenopsis coronata* Speg. Add distribution:—Paraguay; Africa; Brazil; Argentina.

Page 38, For **Perisporina Meliolae** (Stevens) Speg., read **Meliolina Meliolae** (Stevens) Stevens.

For **Perisporina Paulliniae** (Stevens) Speg., read **Meliolina Paulliniae** (Stevens) Stevens.

For **Phaeodimeriella Cayaponiae** (Garman) Seaver & Toro, read **Phaedimeris Cayaponiae** (Garman) Toro, comb. nov. **PHAEODIMERIS** Speg. Rev. Mus. La Plata **15:** 13. 1908. An older name. Synonym, host, and note, belong to the species below and should be so transferred.

For **Phaeodimeriella guarapiensis** (Speg.) Theiss., read **Phaeodimeris guarapiensis** (Speg.) Toro, comb. nov. Synonym, host and note belong to above species and are here transferred accordingly.

Add 15a. **TOROA** Sydow, Jour. Dept. Agric. Porto Rico **10**[2]**:** 20. 1926.

1. **Toroa dimerospoiroides** (Speg.) Sydow, l. c. 1926.

*Asteridium dimerospoiroides* Speg. Fung. Guar. **2:** 17. 1888.
*Perisporium Bromeliae* Stev. Trans. Ill. Acad. Sci. **10:** 168. 1917.
*Chaetrosphaeria Bromeliae* Frag. & Cif. Bol. Real Soc. Esp. Hist. Nat. **25:** 449. 1925.

On *Bromelia Pinguin* L., Porto Rico:—Santo Domingo; South America.

16. **SORICA** Giesen, belongs to the Coryneliaceae. Transfer to this family after **CORYNELIA** Fr.

Page 43, Before **Gibberella pulicaris,** insert: **Gibberella moniliformis** (Sheldon) Wineland, Jour. Agr. Res. **28:** 920. 1924.
Perfect form of *Fusarium moniliformis* Sheldon.
On *Coffea arabica* L. causing wilt seed-beds, Porto Rico:—United States.

Page 47, add **Hypocrella Guaranitica** Speg. Anal. Soc. Ci. Argentina **19:** 47. 1885.
On *Inga laurina* Willd. Porto Rico:—continental South America.

Page 49, add: **Catacauma Amyridis** (Seaver) Chardon, Jour. Dept. Agric. Porto Rico **16:** 170. 1932.

*Phyllachora Amyridis* Seaver, Mycologia **20:** 215. 1928.

On *Amyris elemifera* L., Desecheo: Cuba, Florida, Bahama, Santo Domingo.
A microscopical examination of the type material, from Desecheo Island, shows that the stroma is subepidermal and the species falls under *Catacauma* in Theissen & Sydow's keys.

**Catacauma Ocoteae** Stevens, substitute for and transfer to page 53 as follows:

**Phyllachora perplexans** Chardon, Jour. Dept. Agric. Porto Rico **16:** 182. 1932.

*Catacauma Ocoteae* Stevens, Bot. Gaz. **69:** 251. 1920.

On *Ocotea leucoxylon* (Sw.) Mez, Porto Rico:—endemic.
The nomenclature of this species is very perplexing. Stevens described it as a *Catacauma* but evidently he did not make median sections through the stromata, which show clypei above and below, typically *Phyllachora*-like. The species is thus removed to *Phyllachora* but the specific name *Ocoteae* is untenable in that genus, since there is *P. Ocoteae* P. Henn. from Brasil. Hence a new specific name is proposed here.

Page 50, **Catacauma repens** (Corda) Theiss. & Sydow, omit and substitute

**Catacauma portoricensis** Chardon, Mycologia **19:** 297. 1927.

On *Ficus Stahlii* Warb., Porto Rico:—endemic.
Known only from two collections (*Chardon 1543*, Quebradillas: *Chardon 1608*, Sabana Hoyos, Arecibo).

Add, **Catacauma semilunata** Chardon, Jour. Dept. Agric. Porto Rico **13:** 7. 1929.

On *Eugenia* sp., Porto Rico:—endemic.
This species is based on a single collection made at the Maricao Insular Forest (*Chardon 2964* a). It has lunulate spores and may prove to be the same as *Catacauma Myrciae* (Lév.) Theiss. & Sydow.

**Catacaumella Gouaniae** Stevens, add to distribution: Santo Domingo, Colombia, Costa Rica.

**Diatractium Cordiae** (Stevens) Sydow, add to distribution: Panama.

Omit: Genus **ENGLERODOTHIS** and the species **E. kilimandscharica** (P. Henn.) Theiss. & Sydow, and transfer to page 53 under:

**Phyllachora Mayepeae** Stevens & Dalbey, Bot. Gaz. **68:** 56. 1919.

On *Mayepea domingensis* (Lam.) Krug & Urban, Porto Rico. Endemic.

**Myriogenospora Bresadoleana** P. Henn., add to distribution: Santo Domingo.

Page 51, Genus **PHYLLACHORA** Nitschke.

On account of our recent studies of this genus, important changes and additions are suggested here. Our knowledge of this genus is still far from complete, even for the small island Porto Rico, and occasional new species are still being found.

**Phyllachora Andropogonis** (Schw.) Karst. & Hariot is a composite species which probably does not occur in the island. The specimen referred to it has been described as:

**Phyllachora Ortonii** Chardon, Jour. Dept. Agric. Porto Rico **13:** 9. 1929.

On *Paspalum millegrana* Schrad., Porto Rico: Endemic. Known from a single collection at Naguabo (*Stevens 6763*).

**Phyllachora amphibola** Sydow, Ann. Myc. **24:** 383. 1926.

*Catacauma Ingae* Chardon, Jour. Dept. Agric. Porto Rico **13:** 7. 1929.

On *Inga Inga*, Porto Rico:—Costa Rica.

**Phyllachora minima** Chardon, Jour. Dept. Agric. Porto Rico **16:** 175. 1932.

On *Bouteloua heterostega* (Trin.) Griffiths, Mayaguez, Porto Rico. Endemic.

Omit **Phyllachora assimilis** Theiss. & Sydow, and substitute **Phyllachora brevifolia** Chardon, Jour. Dept. Agric. Porto Rico **13:** 9. 1929.

Same host. Endemic.

Add **Phyllachora Anthephorae** Sydow, Ann. Myc. **13:** 439. 1915.

On *Anthephora hermaphrodita* (L.) O. Kuntze, Jamaica, Costa Rica.

Not collected by recent mycologists. The determination is based on two collections deposited at the N. Y. Botanical Garden: one labelled "Manati ad Coto *6735* Sintenis Collector," and another by Mr. & Mrs. Heller. Both have been compared with the type from Jamaica.

**Phyllachora Canafistulae** Stevens & Dalbey, add to distribution: Costa Rica.

Omit **Phyllachora cornuospora** Atk. and insert: **Phyllachora cornispora-necrotica** Chardon, Bol. Real Soc. Esp. Hist. Nat. **28:** 116. 1928.

On *Paspalum virgatum* L., Porto Rico:—Colombia, Panamá, Guatemala.

Add, **Phyllachora conspicua** Ferd. & Winge, Bot. Tidskr. **29:** 19. 1908.

On *Jacquinii Barbasco* (Loefl.) Mez. St. Croix.

Page 52, Add **Phyllachora Chamaefistulae** Chardon, Jour. Dept. Agric. Porto Rico **16:** 181. 1932.

On *Chamaefistula antillana* Britton & Rose, Porto Rico. Endemic.

**Phyllachora Noblei** Chardon, Jour. Dept. Agric. Porto Rico **16:** 181. 1932.

On *Chiococca alba* (L.) Hitch., Porto Rico. Endemic.

Omit **Phyllachora Eriochloae** Speg., and substitute the following two species:

**Phyllachora insularis** Chardon, Jour. Dept. Agric. Porto Rico **13:** 11. 1929.

On *Valota insularis* (L.) Chase, Porto Rico:—Santo Domingo, Colombia.

**Phyllachora paspalicola** P. Henn. Hedwigia **48:** 106. 1908.

On *Paspalum conjugatum* Berg., Porto Rico:—Panama, continental South America.

**Phyllachora Eugeniae** Chardon, Mycologia **19:** 300. 1927.

On *Eugenia rhombea* (Berg.) Krug & Urban, Porto Rico:—Santo Domingo.

Omit **Phyllachora graminis** (Pers.) Fuckel, formerly reported on various grasses, but all the forms have been referred to other species.

Under **Phyllachora Galactiae** Earle, include as new hosts, *Galactia dubia* DC. and *Bradburya virginiana* (L.) Kuntze; add to distribution, Santo Domingo, continental South America; and include here specimens reported as *Phyllachora Lathyri* (Lév.) Theiss. & Sydow, a European and Asiatic species which should be excluded from our flora.

Under **Phyllachora gratissima** Rehm, add to distribution: Jamaica.

Add **Phyllachora guianensis** Stevens, Illinois Biol. Monog. **8:** 19. 1923.

*Phyllachora Paspali-virgati* Chardon, Jour. Dept. Agric. Porto Rico **13:** 12. 1929.

On *Paspalum virgatum* L., Porto Rico:—continental South America.

Add **Phyllachora inconspicua** Chardon, Mycologia **19:** 299. 1927.

On *Stigmaphyllon lingulatum* (Poir.) Small, Porto Rico. Endemic.

Under **Phyllachora Maydis** Maubl., add to distribution: Guatemala, Colombia.

**Phyllachora Myrciae** (Lév.) Sacc. Syll. Fung. **2:** 597. 1883.

*Dothidea Myrciae* Lév. Ann. Sci. Nat. III. **5:** 264. 1846.

On *Myrcia paniculata* (Jacq.) Krug & Urban, Porto Rico and Tortola:—continental South America.

Page 53. Under **Phyllachora nitens** Garman, add to distribution: Dominica.

Omit **Phyllachora perforans** (Rehm.) Sacc. & Sydow and refer it to **Phyllachora Securidacae** P. Henn.

Under **Phyllachora Phaseoli** (P. Henn.) Theiss. & Sydow, add to distribution: Costa Rica.

Page 54. Under **Phyllachora serjaniicola** Chardon, reported to be endemic, add to distribution: Santo Domingo, Venezuela, Panama.

Under **Phyllachora sphaerosperma** Winter, add to distribution: Santo Domingo.

Add: **Phyllachora Torrubiae** Chardon, Jour. Dept. Agric. Porto Rico **16:** 185. 1932.

On *Torrubia fragrans* (Dum.) Standley, Porto Rico. Endemic.

Under **Phyllachora Tragiae** (Berk. & Curt.) Sacc., add to distribution: Costa Rica.

Add **Phyllachora Ulei** Winter, Grevillea **15:** 90. 1887.

On *Dioscorea* sp., *Rajania cordata* L., Porto Rico:—continental South America.

Page 55. Under **Phyllachora Whetzelii** Chardon, add to distribution:—Santo Domingo.

Omit **Phyllachora Zanthoxyli** Winter, and **Trabutia Zanthoxyli** Chardon and replace both by:

**Phyllachora Winteri** Sacc. & Sydow; Sacc. Syll. Fung. **14:** 673. 1899.

*Phyllachora Zanthoxyli* Winter, Hedwigia **26:** 34. 1887. Not Cooke.
*Trabutia Zanthoxyli* Chardon, Sci. Surv. Porto Rico **8:** 55. 1926.

On *Zanthoxylon martinicence* DC., Porto Rico:—Santo Domingo, Costa Rica. continental South America.

Under **Phaeodothiopsis Eupatorii** Stevens, add to distribution: Honduras.

Omit **Trabutia Guazumae** Chardon, and replace for:

**Phyllachora Guazumae** P. Henn., char. emend. Chardon, Jour. Dept. Agric. Porto Rico **14:** 264. 1930.

*Trabutia Guazumae* Chardon, Mycologia **13:** 291. 1921.

Same host, add to distribution: Santo Domingo and continental South America.

Page 56. After genus **TRABUTIELLA** Theiss. & Sydow, add:

12. **SPHAERODOTHIS** Shear, Mycologia **1:** 162. 1909.

1. **Sphaerodothis luquillensis** Chardon, Jour. Dept. Agric. Porto Rico **13:** 13. 1929.

On *Eriochloa punctata* (L.) Desv., Porto Rico. Endemic.

2. **Sphaerodothis portoricensis** Chardon, Jour. Dept. Agric. Porto Rico **16:** 189. 1932.

On *Arthrostylidium sarmentosum* Pilger, Porto Rico. Endemic.

13. **DICTYOCHORINA** Chardon, Jour. Dept. Agric. Porto Rico **16:** 190. 1932.

1. **Dictyochorina Arundinellae** Chardon, l. c. 1932.

On *Arundinella martinicensis* Griseb., Porto Rico:—Guatemala.

2. **Dictyochorina portoricensis** Chardon, l. c. 1932.

On *Eugenia axillaris* (Sw.) Willd., Porto Rico. Endemic.

After **CHAETOMIUM**, add 2. **MICROASCUS** Zukal, Verhand. Zool. Bot. Gesells. Wien **35:** 333. 1885.

**Microascus trigonosporus** Emmons & Dodge, Mycologia **23:** 317. 1931.

On unknown host, Porto Rico. Endemic.

Page 64, add **Physalospora pyreniella** Petrak, Ann. Myc. **21:** 308. 1923.

On wood, Porto Rico:—endemic.

Page 67, add **Kretzschmaria Clavus** (Fries) Sacc. Syll. Fung. **9:** 565. 1891.

On wood, Porto Rico:—continental South America; Ceylon.

**Kretzschmaria spinifera** Ellis & Macbr. Bull. Lab. Nat. Hist. Univ. Iowa **4:** 71. 1896.

On bark, Porto Rico:—Mexico.

Page 69, add **Xylaria Bruneriana** Seaver, Bull. Torrey Club **50:** 309. 1923.

On fallen seeds of *Euterpe globosa* Gaert., Porto Rico:—endemic.

Page 72, add **Phillipsia dochmia** (Berk. & Curt.) Seaver, N. Am. Cupfungi 184. 1928.

*Peziza dochmia* Berk. & Curt.; Berk. Jour. Linn. Soc. **10:** 364. 1869.

On rotten wood, Porto Rico:—Cuba.

Page 79, 1. **Cryptostictis hysterioides** Fuckel, has been shown to belong to the Melanconiaceae. Transfer next to *Colletotrichum* of that family.

After **DARLUCA** Cast., add: 7a. **DAVISIELLA** Petrak, Ann. Myc. **22:** 134. 1924.

**Davisiella Elymina** (Davis) Petrak, l. c. 1924.

According to Petrak (Ann. Myc. **25:** 258. 1927), what Stevens described as *Gloniella rubra* is a composite species made of different forms, to which the conidial stage is referred to the species above.

On *Arthrostylidium multispicatum* Pilger, Porto Rico. Endemic.

For **Diplodia cacaoicola** P. Henn., substitute **Diplodia Theobromae** (Pat.) Nowell, Dis. Crop Plants in Lesser Antilles, page 159, a better name.

Page 84, **Vericularia graminicola** West, read **Vermicularia graminicola** West.

Page 85, **Zythia Phaseoli** Stevens, transfer to **Sirozythia Phaseoli** (Stevens) Toro, comb. nov. The genus **SIROZYTHIA** Henn. Ann. Myc. **2:** 48. 1904 has catenulate spores as shown by this species.

In family **LEPTOSTROMATACEAE,** add, 3. **LEPRIEURINA** Arnaud, Ann. Ec. Agr. Montpellier **16:** 210. 1918.

**Leprieurina radiata** Toro, Jour. Dept. Agric. Porto Rico **10**[2]**:** 16. 1926.

On *Crysobalanus Icaco* L., Porto Rico. Endemic.

Page 86, Add **Colletotrichum Agaves** Cav. Fungi Longob. exs. Pug. 100.

On *Agave sisalana* Perrine, Porto Rico:—Brazil.

**Colletotrichum Cajani** Rangel, Bol. Agr. Sao Paulo **16:** 154. 1915.

On *Cajan Cajan* (L.) Millsp., Porto Rico:—Brazil.

**Colletotrichum Chardonianum** Nolla, Jour. Dept. Agric. Porto Rico **17:** 120. 1927.

On *Allium Cepa* L., Porto Riço. Endemic.

**Colletotrichum circinans** (Berk.) Voglino, Ann. R. Acad. Agr. Torino **49:** 175. 1907.

*Vermicularia circinans* Berk. Gard. Chron. **1851:** 595. 1851.

On *Allium Cepa* L., Porto Rico:—United States.

Page 87, **Melanconium Sacchari** Massee. See **PLEOCYTA.**

**Pestalozzia funerea** Desm., omit host *Musa paradisiaca* L.

Page 88, **Pestalozzia Guepini** Desm., according to Guba, Phytopath. **19:** 219, is restricted to *Camellia.* Specimens from Porto Rico belong to other species.

Add, **Pestalozzia leprogena** Speg. Anal. Mus. Nac. Buenos Aires **23:** 119. 1912.

*Pestalozzia funerea* of Stevens not Desmaziéres.

On *Musa paradisiaca* L., Porto Rico:—Argentina.

Add, **Pestalozzia virgatula** Klebahn, Myc. Cent. **4:** 13. 1914.

*Pestalozzia Guepini* of Stevens.

On *Mangifera indica* L., Porto Rico:—Philippines.

After **PESTALOZZIA** add 4a. **PLEOCYTA** Petrak & Sydow, Beiheft Repert. Spec. Nov. **42:** 454. 1927.

**Pleocyta Sacchari** (Massee) Petrak & Sydow, l. c.

*Melanconium Sacchari* Massee; Speg. Rev. Agron. y Vet. La Plata **2:** 242. 1896.

On dead and dying stalks and leaf sheaths of *Saccharum officinarum* L., Porto Rico:—continental South America.

4b. **STEIROCHAETE** A. Br. & Casp. Krank. Pfl. **1:** 28. 1886.

**Steirochaete Capsici** (Sydow) Sacc. Philippine Jour. Sci. **18:** 605. 1921.

*Vermicularia Capsici* Sydow, Ann. Myc. **11:** 329. 1913.

On *Capsicum frutescens* L., Porto Rico:—Philippines; United States.

**Steirochaete McClellandii** Toro, sp. nov.

Maculas orbiculares coalescentes, amphigenae, lutescentes albescentes, areola infuscata v. ferruginascente diffusa cinctae; acervuli hypophyllae, errumpentes; aetis erectae, continua, fuligineae; sporulae curvati, continuae, attenuato-acutata, laeves guttulatae, hyaline.

In foliis vivis *Chrysalidocarpus lutescens* Wendl., prope Mayaguez, leg. T. B. McClelland.

Spots amphigeous, round, sometimes coalescing to form indefinite lesions with brown margins, center yellowish at first, whitish with age; mycelium septate, brown, internal, 3–4 $\mu$ wide; acervuli hypogynous, breaking through the epidermis, unevenly distributed on the spot, numerous, 40–85 $\mu$ wide; setae continuous, dark brown, 130–400 $\mu$ long, tips hyaline, surpassing the height of acervuli and easily visible as minute dark, filiform structures protruding from the leaf surface; conidiophores indistinct; spores cylindric fusoid, curved, often catenate, 20–25 $\times$ 7–10 $\mu$, hyaline.

**Acrostalagmus albus** Preuss, strike out aphids hosts and add:

On soils.

Add, **Acrostalagmus Aphidium** Outl. Beitr. Bot. Cent. **1902:** 15. 1902.

*Acrostalagmus albus* of Jones, Johnston & Stevenson, not of Preuss.

On *Aphis Gossypii* Glover on *Abelmoschus esculentus* (L.) Moench., *Cucumis sativus* L., *Cucumis Melo* L., *Xanthosoma sagittaefolium* (L.) Schott., *Caladium Colocasia* (L.) W. F. Wight; on *Rhopalosiphum Persicae* Sulzer on *Solanum Melongena* L., *Capsicum baccatum* L.; on *Toxoptera aurantiae* Boyer on *Coffea arabica* L., *Citrus sinensis* (L.) Osbeck, *Mammea americana* L., *Citrus grandis* (L.) Osbeck; on *Sipha flava* on *Saccharum officinarum* L.; on *Corythaica monacha* Stal., on *Solanum Melongena* L.; on *Aphis pseudobrassicae* Davis on *Brassica oleracea* L.; on *Carolinaia Cyperi* Ainslie on *Cyperus rotundus* L.; on undetermined aphids on *Cryptostegia madagascarensis* Hemsl., on *Osmia odorata* (L.) Sch. Bip.

Page 89, add **Didymaria borinquensis** (Young) Stevens & Solh. Mycologia **23:** 400. 1931.

*Cercospora borinquensis* Young, Mycologia **8:** 45. 1916.

On *Calopogonium orthocarpum* Urban, Porto Rico. Endemic.

After **DIPLOSPORIUM** add: 9a. **GEOTRICHUM** Link & Osb. Mycologia **1:** 53. 1909.

**Geotrichum candidum** Link, l. c. 1909.

On human skin, Porto Rico:—continental America.

**Monilia sitophila** Mont., the perfect stage has been described as: **Neurospora sitophila** Shear & Dodge, Jour. Agric. Res. **34:** 1026. 1927.

For **Monogrammia Miconiae** Stevens, read **Areneomyces Miconiae** (Stevens) Toro, comb. nov. **ARENEOMYCES** Hoehn, Sitz-ber. Akad. Wien. **118:** 894. 1909. An older name.

Page 90, add **Ramularia tenuis** (Sydow) Toro, comb. nov.

*Eriomycopsis tenuis* Sydow, Ann. Myc. **25:** 137. 1927.

On mycelium of *Parodiopsis Stevensii* Arn. on *Inga* sp. Porto Rico:—Central America; Santo Domingo.

Page 91, add **Sporotrichum Citri** (Massee) Butler, Trans. Brit. Myc. Soc. **10:** 119. 1924.

*Cladosporium Citri* Massee, Text Book Pl. Dis. 310. 1899.
*Sphaceloma Fawcetti* Jenkins, Phytopath. **15:** 103. 1925.
*Gloeosporium Fawcetti* Heald, Man. Plant Dis. 656. 1926.

On *Citrus* sp., Porto Rico:—continental America; West Indies; Africa.

**Sporotrichum Mansoni** (Cast.) Toro, comb. nov.

*Cladosporium Mansoni* Pinoy; Cast. & Chalmers, Man. of Trop. Med. Ed. **2:** 837. 1913.
*Macrosporium Mansoni* Castellani—1905.

Occurring as the cause of a human skin disease, black ring-worm, Porto Rico:—tropical lands.

After **TRICHOTHECIUM** Link, add 23a. **VASCULOMYCES** Ashby, Bull. Dept. Agric. Jamaica **2:** 151. 1913.

**Vasculomyces Xanthosomae** Ashby, l. c. 1913.

On *Xanthosoma* sp. causing the well-known "mal de la Yautía," Porto Rico:—Jamaica; Santo Domingo.

Before **Acrothecium flacatum** Tehon, insert: **Acrothecium Capsici** Turconi, Riv. Pat. Veg. **9:** 132. 1919.

On *Capsicum frutescens* L., Porto Rico:—Italy.

**Acrothecium obovatum subcapitulatum** Cif. & Ashf. Mycologia **22:** 184. 1930.

On human skin, Porto Rico. Endemic.

**Acrothecium polytriadis** Toro, sp. nov.

Maculae amphigenae, primitus minutae, flavidulae non vel parum determinatae, dein confluentes expansae et haud raro magnam folii partem occupantes vel totum bruneolum folium decolorantes; caespituli sat regulariter dense vel laxe dispositi, minutissimi, e cellulis pelucide brunneis contextum; conidiophoras ad apicem late rotundata ibique papillulis 3 minutis praedita; conidia olivaceo luniformia 3-septatis non vel vix constricta.

Ad foliis vivis *Polytriadis amauris* L., in hortis colitur, prope Mayaguez, leg. T. B. McClelland.

Spots amphigenous, at first small, yellowish, then coalescing, on the tips, less definitely circumscribe but twisting the leaf, often merging into a generally diffused light brown discoloration covering the whole leaf; mycelium light olive-brown, pellucid, thick-walled, closely septate; individual cells, 13–45 × 3 μ; conidiophores emerging between the epidermal cells, sometimes arising from the stomata, amphigenous, simple, 124 × 160 μ long, concolorous with mycelium, substending three spores at the tip of simple, slender sterigmata; spores olivaceous, luniform or somewhat straight, 3 septate, borne apically on the conidiophore in fascicles of 3, 40–48 × 17 μ; third cell from the base enlarged, dark, roundish; terminal cells small, nearly hyaline.

Add **Alternaria Brassicae** (Berk.) Sacc. Michelia **2:** 172. 1880.

On *Brassica oleracea* L., Porto Rico:—Colombia; United States.

Page 92, For **Cercospora Amaryllidis** Ellis & Ev. read **Cercospora cratii** Ellis & Ev. Jour. Myc. **3:** 15. 1887. An older name.

**Cercospora borinquensis** Young, see **Didymaria.**

Page 93, add **Cercospora brachypoda** Speg. Anal. Soc. Ci. Argentina **12:** 1881.

On *Abutilon hirtum* (Lam.) Sweet, *Abelmoschus esculentus* Moench, Porto Rico:—South America.

**Cercospora Cajani** P. Henn., see synonym under genus **MYCOVELLOSIELLA.**

Add **Cercospora Caladii** Cooke, Grevillea **8:** 95. 1879.

On *Cyrtospadix bicolor* (Ait.) Britton & Rose, Porto Rico:—Europe.

**Cercospora Calotropidis** Ellis & Ev. Ann. Rept. Missouri Bot. Gar. **9:** 120. 1898.

On *Calotropis procera* (Ait.) R. Br., Porto Rico:—United States.

**Cercospora canescens** Ellis & Martin, add host, *Macroptilium lathyroides* (L.) Urban.

**Cercospora Caseariae** Stevens, add host, *Casearia guianensis* (Aubl.) Urban.

**Cercospora Cassavae** Ellis & Ev., see under genus **RAGNHILDIANA.**

Add **Cercospora Clitoriae** Atk. Jour. Elisha Mitchell Sci. Soc. **8:** 62. 1892.

On *Clitoria ternatea* L., Porto Rico:—United States; Santo Domingo; Venezuela.

**Cercospora cylindrospora** Solh. & Stevens, Mycologia **23:** 376. 1931.

On *Bradburya pubescens* (Benth.) Kuntze, Porto Rico. Endemic.

**Cercospora conspicua** Earle, add host, *Cleome gynandra* L.

**Cercospora cruenta** Sacc., add host, *Phaseolus vulgaris* L.

Page 94, **Cercospora cucurbiticola** P. Henn., is not this species but **Cercospora Cayaponiae** Stevens & Solh. Mycologia **23:** 386. 1931.

Add **Cercospora Elephantopis** Ellis & Ev. Jour. Myc. **3:** 15. 1887.

On *Elephantopus mollis* H. B. K., Porto Rico:—continental America.

**Cercospora flagellifera** Ait. Jour. Elisha Mitchell Sci. Soc. **8:** 51. 1892.

On *Galactia striata* (Jacq.) Urban, Porto Rico:—United States.

**Cercospora Helicteres** Sydow, Philippine Jour. Sci. Bot. **9:** 189. 1914.

*Cercospora trichophilla* Stevens, Trans. Ill. Acad. Sci. **10:** 212. 1917.

On *Solanum torvum* Sw., Porto Rico:—Philippines.

**Cercospora Hemidiodiae** Toro, Jour. Dept. Agric. Porto Rico **14:** 288. 1930.

On *Hemidiodia ocimifolia* (Willd.) K. Schum., Porto Rico:—Colombia.

**Cercospora instabilis** Rangel, Bol. Agr. Sao Paulo **16:** 151. 1915.

*Cercosporina instabilis* (Rang.) Sacc. Syll. Fung. **25:** 905. 1931.

On *Cajan Cajan* (L.) Millsp., Porto Rico:—Brazil.

**Cercospora Ipomoeae** Winter, Hedwigia **26:** 34. 1887.

On *Ipomoea* sp., *Ipomoea Pes-caprae* (L.) Roth., Porto Rico:—United States.

**Cercospora Lantanae** Chupp, Jour. Dept. Agric. Porto Rico **15:** 10. 1931.

On *Lantana Camara* L., Porto Rico:—Bermuda.

Page 95, **Cercospora Mucunae** Sydow, is not this species but **Cercospora [illegible]obii** Sydow, Ann. Myc. **11:** 270. 1913.

[illegible]t *Stizolobium pruritum* of above spedcies, as reported by Toro, is not this [illegible]t *Stizolobium Deeringianum* Bort.

Add **Cercospora Musarum** Ashby, Bull. Dept. Agric. Jamaica **2⁶:** 95. 1913.
On *Musa Cavendishii* Lamb., Porto Rico:—Jamaica; Bermuda.

**Cercospora papillosa** Atk. Jour. Elisha Mitchell Sci. Soc. **8:** 1902.
On *Valerianoides jamaicensis* (L.) Kuntze, Porto Rico:—continental America.

**Cercospora Phaseolorum** Cooke, Grevillea **12:** 30. 1883.
On *Phaseolus adenanthus* G. F. W. Meyer, Porto Rico:—continental America.

**Cercospora Phyllanthae** Chupp, Jour. Dept. Agric. Porto Rico **15:** 12. 1931.
On *Phyllanthus Niruri* L., Vieques Island. Endemic.

Page 96, **Cercospora simulata** Ellis & Ev., add host, *Ditremexa occidentalis* (L.) Britton & Rose.

**Cercospora trichophila** Stevens, substitute, **Cercospora Helicteres** Sydow, Philippine Jour. Sci. Bot. **9:** 189. 1914. A better name.

Add **Cercospora Turnerae** Ellis & Ev. Ann. Rept. Mo. Bot. Gar. **9:** 119. 1898.
On *Turnera ulmifolia* L., Porto Rico:—continental America.

**Cercospora Vignae** Racib. add host, *Vigna repens* (L.) Kuntze.

Add **Cercospora Whetzelii** Chupp, Jour. Dept. Agric. Porto Rico **15:** 16. 1931.
On *Argemone mexicana* L., Porto Rico. Endemic.

Page 97, **Cladosporium Citri** Massee, see **SPOROTRICHUM.**

**Cladosporium Mansoni** (Cast.) Pinoy; Cast. & Chalmers, see **SPOROTRICHUM.**

Page 98, **Haplographium echinatum** (Riv.) Sacc., change to **Cephalotrichum echinatum** (Riv.) Toro, comb. nov.

**Haplographium portoricense** Stevens & Dalbey, change to **Cephalotrichum portoricense** (Stevens & Dalbey) Toro, comb. nov.

Page 99, **Helminthosporium Sacchari** Butler, does not occur here. The species so referred is **Helminthosporium ocellum** Farris, Phytopath. **18:** 757. 1928.

Add **Helminthosporium stenospilum** Dreschler, Phytopath. **18:** 136. 1928.
On *Saccharum officinarum* L., Porto Rico:—Cuba; Santo Domingo; United States.

**Helminthosporium Turcicum** Pass., add synonym *Helminthosporium inconspicum* Cooke & Ellis, Grevillea **6:** 88. 1878.

Page 100, **Macrosporium parasiticum** Thüm., see **THYROSPORA** below.

For **Macrosporium Porri** Ellis, read **Alternaria Porri** (Ellis) Cif. Jour. Dept. Agric. Porto Rico **14:** 31. 1930. Add synonym: *Alternaria Allii* Nolla, Phytopath. **17:** 115. 1927.

For **Passalora Cecropiae** Stevens, substitute, **Fusicladium Cecropiae** (Stevens) Toro, comb. nov., a better name.

After **PERICONIA** Tode, add 20a. **RAGNHILDIANA** Solh. Mycologia **23:** 402. 1931.

1. **Ragnhildiana gonatoclada** (Sydow) Stevens, Mycologia **23**: 403. 1931.
*Cercospora gonatoclada* Sydow, Ann. Myc. **23**: 425. 1925.
On *Iresine paniculata* (L.) Osbeck, Porto Rico:—Central America.

2. **Ragnhildiana Manihotis** Stevens & Solh. Mycologia **23**: 404. 1931.
*Cercospora Cassavae* of Stevenson.
*Cercospora Henningsii* of Toro.
On *Manihot Manihot* (L.) Cock., Porto Rico. Endemic.

**Septoidium Stevensii** Arnaud, change to **Clasterosporium Stevensii** (Arn.) Toro, comb. nov.

Page 101, after **THIELAVIOPSIS** add 25a. **THYROSPORA** Tehon & Daniels, Phytopath. **15**: 714. 1925.

**Thyrospora parasitica** Angell, Jour. Agr. Res. **38**: 485. 1929.
*Macrosporium parasiticum* Thüm. Myc. Univ. 667. 1877.
On *Allium Cepa* L., Porto Rico:—Bermuda; continental America.

After **TRIPSOSPORIUM,** add 26a. **MYCOVELLOSIELLA** Rangel, Arch. Jard. Bot. Rio Janeiro **2**: 71. 1917.

**Mycovellosiella Cajani** (P. Henn.) Rangel, l. c. 1917.
*Cercospora Cajani* P. Henn. Hedwigia **41**: 309. 1902.
*Vellosiella Cajani* Rangel, Bol. Agr. Sao Paulo **16**: 151. 1916.
On *Cajan Cajan* (L.) Millsp., Porto Rico:—Brazil; Barbados.

Page 102, **Isariopsis griseola** Sacc., add host, *Phaseolus lunatus* L.

Page 104, add **Fusarium batatatis Vanillae** Tucker, Jour. Agric. Res. **35**: 1127. 1927.
On *Vanilla Vanilla* (L.) Britton, Porto Rico:—United States.

**Fusarium cubense inorodatum** Brandes, Phytopath. **9**: 374. 1919.
On *Musa sapientum* L., Porto Rico.

**Fusarium moniliforme** Sheldon, Nebraska Agr. Exp. Sta. Ann. Rept. **1903**: 23–32. 1903.
The perfect form has been found to be a *Gibberella.*
On *Zea Mays* L., *Saccharum officinarum* L., *Coffea arabica* L., Porto Rico:—United States.

Page 105, **Rhizoctonia ferrugena** Matz, add hosts:
*Allium Cepa* L., *Beta vulgaris* L., *Brassica campestris* L., *Brassica integrifolia* (West.) O. E. Schultz, *Brassica oleracea* L., *Cajan Cajan* (L.) Millsp., *Cucumis sativus* L., *Daucus Carota* L.

Page 106, **Grallomyces portoricensis** Stevens, add distribution:—British Guiana.

Page 109, **Mykosyrinx Cissi** (DC.) G. Beck, add distribution:—St. Thomas.

Page 181, **Perisporium Bromeliae** Stevens, see synonyms under *Toroa* Sydow.

# SUPPLEMENT TO UREDINALES

By Frank D. Kern

Since the publication of the original list, 1926, some omissions and errors have come to light and several additions are to be made, based on new material. Collections responsible for additions have been furnished chiefly by Messrs. Chardon, Toro, and Barrus. The statement regarding distribution has not been changed, except in a few instances, although in a number of species the range has been extended both within Porto Rico and outside. Here are added 11 species, bringing the total number of rusts known in Porto Rico and the Virgin Islands up to 189. Recent studies of Santo Domingo rusts by Kern, Ciferri and Thurston have added to knowledge of Porto Rico species.

Page 114, **Milesia australis** Arth. The specimen on *Polytaenium Feei* (Schaffn.) Maxon probably does not belong here.

Page 117, **Botryorhiza Hippocrateae** Whetzel & Olive. Known also from Cuba and Dominican Republic.

Page 121, **Uromyces Arachidis** (Speg.) P. Henn. Should be referred to **Puccinia Arachidis** Speg. The fact that the host is a legume would lead one to expect a *Uromyces*. The Porto Rican specimens have only uredinia. Spegazzini has described *Puccinia* teliospores from Paraguay and there is every reason to believe that our specimens belong with the South American species (see N. Am. Flora **7:** 484, 1922).

Page 124, add **Uromyces Iresines** Lagerh.; Sydow, Monog. Ured. **2:** 227. 1910.

Reported from St. Thomas (N. Am. Flora **7:** 444, 1921) on *Iresine elatior* Rich. for which an older name is *Iresine angustifolia* Euph. Known also from Guatemala and South America.

Page 126, add **Puccinia Anthephorae** (Sydow) Arth. & Johnston, Mem. Torrey Club **17:** 137. 1918.

Known from St. Croix through a phanerogamic specimen, in The New York Botanical Garden, of *Anthephora hermaphrodita* (L.) Kuntze (*A. elegans* Schreb.) collected Feb. 6, 1896, *Alfred E. Ricksecker 253*, which bears a few teliospores. Known also in Cuba and Jamaica.

Page 128, **Puccinia Cyperi** Arth. It seems best to list the specimens on *Kyllinga* as **Uredo Kyllingiae** P. Henn. rather than as *Puccinia Cyperi* (see Mycologia **18:** 144, 1926).

Page 129, add **Puccinia Ellisiana** Thüm. on *Andropogon glomeratus* (Walt.) B. S. P. This is founded on a collection by *Whetzel, Chardon, & Toro 3351*, Mountains above Yauco, May 24, 1931. In N. Am. Flora **7:** 280 this rust is listed as *Dicaeoma Marie-Wilsoni* (Peck) Arth. & Fromme.

Page 129, **Puccinia Emiliae** P. Henn. Add the host *Emilia coccinea* (Sims) Sweet, Barros, March 1, 1928, *Barrus 3173;* Barranquitas, May 25, 1928, *Barrus 3180.*

**Puccinia eslavensis** Diet. & Holw. This name becomes a synonym of **Puccinia atra** Diet. & Holw. (See N. Am. Flora **7:** 775, 1926.)

Page 130, **Puccinia** (?) **fuirenicola** Arth. The doubt should be removed as teliospores have been found on a specimen from the Dominican Republic. Arthur had previously referred a *Uredo*-form to *Puccinia* without evidence in the form of teliospores.

Page 133, add **Puccinia Leptochloae** Arth. & Fromme, on *Leptochloa filiformis* (Lam.) Beauv. This was overlooked in the original list. (See N. Am. Flora **7:** 321. 1920.) The specimen was collected at St. Isabela, Sept. 24, 1918, *John A. Stevenson 7113.*

Page 133, **Puccinia Lithospermi** Ellis & Kellerm. This name becomes a synonym of **Puccinia tuyutensis** Speg. (See N. Am. Flora **7:** 791. 1926.)

Page 135, add **Puccinia polysora** Underw. Bull. Torrey Club **24:** 86. 1897.
Two collections on *Tripsacum laxum* Nash, Guatemala Grass, one from the College grounds, Mayaguez, by *R. A. Toro,* and one from Villalba, by *J. F. Acosta.* This rust is now reported as widespread and causing real injury to this forage grass.

Page 135, add **Puccinia redempta** Jackson, Mycologia **14:** 107. 1922.
The type specimen is on *Eupatorium atriplicifolium* Lam. from Tortola. It is known only from the type locality.

Page 137, Under **Puccinia substriata,** *Eriochloa polystachya* H. B. K. is an older name for *Eriochloa subglabra* (Nash.) Hitchc.

Page 139, add **Uredo amicosa** Arth. Bull. Torrey Club **46:** 121. 1919.
The type locality is Mayaguez, Porto Rico, on *Chrysophyllum Cainito* L. collected March 29, 1917 by *H. E. Thomas 264.* This was overlooked in the original list.

Page 139, **Uredo Anthurii** (Hariot) Sacc. Now known also from Colombia and the Dominican Republic.

Page 140, add **Uredo Chardoni** Kern, sp. nov.
Uredosoris amphigenis, sparsis, oblongis vel linearibus, parvis, 0.2–0.5 mm. longis, mox nudis, pulverulentis, luteis; epidermide rupta visibili; uredosporis globoideis vel late ellipsoideis, summe parvis, 12–15 × 15–19 $\mu$; membrana hyalina, 1.5–2 $\mu$ cr., minute verrucoso-echinulata; poris obscuris, fortasse 4–6, sparsis.
On *Bouteloua heterostega* (Trin.) Griffiths, Guanajibo, near Mayaguez, Porto Rico, Dec. 7, 1931, *C. E. Chardon* and *R. A. Toro.*
This is an outstanding species on account of the small size of the urediniospores. A careful examination of North American species of *Puccinia* on grasses does not reveal any species with spores so small. The nearest approach is *Uromyces Andropogonis* Tracy ( *U. pedatatus* (Schw.) Sheldon) on *Andropogon* which has urediniospores 13–17 × 16–19 $\mu$. No teliospores can be found on the specimen. The host was determined by Dr. A. S. Hitchcock, of the Smithsonian Institution.

Page 141, **Uredo Dichromenae** Arth. Transfer to **Puccinia Dichromenae** (Arth.) Jackson, Trans. Brit. Myc. Soc. **13:** 16. 1928.
Teliospores were discovered on specimens from Bermuda.

Page 141, omit **Uredo farinosa** P. Henn. This fungus does not belong to the Uredinales.

Page 144, **Uredo superior** Arth. Transfer to **Puccinia superior** (Arth.) Jackson, Trans. Brit. Myc. Soc. **13:** 20. 1928.
Teliospores were discovered on specimens from Bermuda.

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**Number of Titles 220.**

# REVISION OF THE MYXOMYCETES

By Robert Hagelstein

This paper is a revision of the Myxomycetes as previously published in 1926, by Seaver and Chardon in Vol. VIII, Part 1, pages 3–9, and 181, of the Scientific Survey of Porto Rico and the Virgin Islands. The species collected by the writer in Porto Rico and published in 1927[1] have been added, also those from the Virgin Islands published by Raunkiaer in 1928,[2] thereby bringing the record to that date. While changes and corrections have been made in the text, the class name Myxomycetes and the classification adopted by Seaver and Chardon have been retained, so as not to transform entirely the arrangement of the earlier authors. The writer believes however, that this group is more closely allied to the animal kingdom, and should be classified therewith, or, left as an intermediate group until opinion becomes more uniform as to its position.

The classification followed is that of Macbride in the second edition of North American Slime-moulds, and the descriptions of orders and families are also taken therefrom, although somewhat altered. Determinations of species as originally recorded have been made by Miss G. Lister, Dr. W. C. Sturgis, Prof. T. H. Macbride, and the writer.

## MYXOMYCETES.

Chlorophyl-less organisms whose vegetative phase consists of a naked mass of multi-nuclear protoplasm, the plasmodium; reproduced by spores which are either free or more commonly enclosed in plant-like sporangia or aethalia, and which on germinating produce ciliated or amoeboid zoöspores, whose coalescence gives rise to the plasmodium.

### Sub-class PHYTOMYXINAE.

1. **PLASMODIOPHORA** Woronin, Jahrb. Wiss. Bot. **11**: 548. 1878.

1. **Plasmodiophora vascularum** Matz, Jour. Dept. Agric. Porto Rico **4**: 45. 1920.

On *Saccharum officinarum* L., Porto Rico:—Barbados. According to M. T. Cook, causing much injury to this most important host.

### Sub-class EXOSPOREAE.

#### Family 1. CERATIOMYXACEAE.

1. **CERATIOMYXA** Schröt. in E. & P. Nat. Pfl. I. **1**: 16. 1889.

1. **Ceratiomyxa fruticulosa** (Muell.) Macbr. N. Am. Slime-moulds, ed. 1. 18. 1899.

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[1] Mycologia **19**: 35. 1927.

[2] Dansk Bot. Arkiv $5^{16}$: 1. 1928.

*Byssus fruticulosus* Muell. Fl. Dan. *pl.* 718, *f.* 2. 1777.

On dead wood, Porto Rico; St. Croix; St. Thomas; St. Jan:—widely distributed.

Sub-class **MYXOGASTRES.**

Spore mass black or violaceous, rarely ferruginous.
Capillitium present and well developed, thread-like; sporangia calcareous more or less throughout. Order 1. PHYSARALES.
Capillitium present and usually arising from a well developed columella; sporangia not calcareous except in a single genus; and then confined to the columella. Order 2. STEMONITALES.
Spore mass never black, usually some shade of brown or yellow, rarely purplish or rosy.
Capillitium none or very poorly developed; spores some shade of brown, rarely purple. Order 3. CRIBRARIALES.
Capillitium by outward interweaving making up the aethalial wall; spores pale, ashen. Order 4. LYCOGALALES.
Capillitium well developed, made up of more or less distinctly sculptured threads; spores generally yellow. Order 5. TRICHIALES.

Order 1. **PHYSARALES.**

Sporangia often calcareous throughout; capillitium intricate. Fam. 1. PHYSARACEAE.
Sporangia with calcareous deposits limited to the peridium or sometimes the stipe; capillitium simple. Fam. 2. DIDYMIACEAE.

Family 1. **PHYSARACEAE.**

1. **CRATERIUM** Trentepohl; Roth, Catalecta **1:** 224. 1797.

1. **Craterium aureum** (Schum.) Rost. Sluz. Monog. 124. 1875.

*Trichia aurea* Schum. Enum. Pl. Saell. **2:** 208. 1803.

On humus and cane trash, occasionally on living stalks and leaves, Porto Rico:—continental North America; Europe.

2. **Craterium leucocephalum** (Pers.) Ditm.; Sturm, Deutsch. Fl. Pilze **1:** 21. 1813.

*Stemonitis leucocephala* Pers.; Gmel. Syst. Nat. 1467. 1791.

On dead leaves and debris, occasionally fruiting on living sugar cane, Porto Rico:—continental North America; Europe.

2. **FULIGO** Haller, Hist. Helv. **3:** 110. 1768.

1. **Fuligo septica** (L.) Weber; Wigg. Pr. Fl. Holsat. 112. 1780.

*Mucor septicus* L. Sp. Pl. ed. 2. 1656. 1763.

On dead cane leaves, banana debris, and rotten wood, Porto Rico; St. Croix; St. Jan:—world wide in distribution.

3. **PHYSARELLA** Peck, Bull. Torrey Bot. Club **9:** 61. 1882.

1. **Physarella oblonga** (Berk. & Curt.) Morg. Jour. Cin. Soc. **19:** 8. 1896.

*Trichamphora oblonga* Berk. & Curt. Grevillea **2:** 66. 1873.

St. Croix:—continental North America; the tropics.

4. **PHYSARUM** Persoon, Ann. Bot. Usteri **15:** 5. 1795.

1. **Physarum aeneum** R. E. Fries, Ark. Bot. **1:** 62. 1903.

*Physarum murinum aeneum* Lister, Jour. Bot. **36:** 117. 1898.

St. Croix:—West Indies.

2. **Physarum bitectum** Lister, Mycetozoa ed. 2. 78. 1911.

*Physarum Diderma* Lister, non Rost. Jour. Bot. **29**: 260. 1891.

On dead leaves of Clusia, Porto Rico:—widely distributed.

3. **Physarum bogoriense** Racib. Hedwigia **37**: 52. 1898.

Porto Rico; St. Croix:—continental North America; the tropics.

4. **Physarum cinereum** (Batsch) Pers. Neues Mag. Bot. **1**: 89. 1794.

*Lycoperdon cinereum* Batsch, Elench. Fung. **1**: 155. 1783.

Fruiting on living leaves of *Lactuca sativa* L., *Phaseolus vulgaris* L., *Saccharum officinarum* L., *Vigna unguiculata* (L.) Walp., and other hosts, Porto Rico:—widely distributed throughout the tropics and elsewhere.

5. **Physarum columbinum** (Rost.) Sturgis, Mycologia **8**: 200. 1916.

*Tilmadoche columbina* Rost. Mon. App. 13. 1876.

On rotten wood, Porto Rico; St. Thomas:—continental North America; West Indies; the tropics generally.

Listed by Seaver and Chardon, with an explanatory note, as *Physarum wingatense* Macbr. The name **Physarum columbinum** (Rost.) Sturgis, under which it was originally reported, is here retained.

6. **Physarum compressum** Alb. & Schw. Consp. Fung. 97. 1805.

On leaves, twigs, and sugar cane debris, Porto Rico:—widely distributed.

7. **Physarum didermoides** (Ach.) Rost. Sluz. Monog. 97. 1875.

*Spumaria* (?) *didermoides* Ach.; Pers. Syn. Fung. Addenda XXIX. 1801.

On rotten wood, Porto Rico:—world wide in distribution.

8. **Physarum melleum** (Berk. & Br.) Massee, Monog. 278. 1892.

*Didymium melleum* Berk. & Br. Jour. Linn. Soc. **14**: 83. 1873.

On dead leaves and twigs, Porto Rico:—continental North America; abundant in the tropics.

9. **Physarum nutans** Pers. Ann. Bot. Usteri **15**: 6. 1795.

On dead leaves and twigs, Porto Rico:—widely distributed and common.

10. **Physarum polycephalum** Schw. Syn. Fung. Car. 63. 1822.

On dead wood, Porto Rico:—continental North America; West Indies.

10a. **Physarum polycephalum obrusseum** (Berk. & Curt.) Lister, Mycetozoa ed. 2. 58. 1911.

*Didymium obrusseum* Berk. & Curt. Jour. Linn. Soc. **10**: 348. 1869.

St. Croix; St. Jan:—continental North America; West Indies.

11. **Physarum pusillum** (Berk. & Curt.) Lister, Mycetozoa ed. 2. 64. 1911.

*Didymium pusillum* Berk. & Curt. Grevillea **2**: 53. 1873.

On rotten sacking, and also on the living leaves of *Saccharum officinarum* L., Porto Rico:—widely distributed.

Listed by Seaver and Chardon, with an explanatory note, as *Physarum nodulosum* Cooke & Balf. The name **Physarum pusillum** (Berk. & Curt.) Lister, under which it was originally reported, is here retained.

12. **Physarum reniforme** (Massee) Lister, Mycetozoa ed. 2. 72. 1911.

*Tilmadoche reniformis* Massee, Mon. 336. 1892.

On dead wood, Porto Rico:—throughout the tropics.

13. **Physarum rigidum** G. Lister, Mycetozoa ed. 3. 36. 1925.

*Physarum viride rigidum* Lister, Mycetozoa ed. 2. 56. 1911.

St. Croix; St. Thomas:—West Indies; the tropics generally.

14. **Physarum sessile** Brandza, Ann. Sc. Univ. Jassy **11:** 116. 1921.
*Physarum variable sessile* Lister, Jour. Bot. **36:** 114. 1898.
On dead leaves, Porto Rico:—widely distributed but not common.

15. **Physarum tenerum** Rex, Proc. Acad. Phila. **1890:** 192. 1890.
Porto Rico; St. Croix:—continental North America; West Indies.

16. **Physarum viride** (Bull.) Pers. Ann. Bot. Usteri **15:** 6. 1795.
*Sphaerocarpus viridis* Bull. Herb. Fr. *pl. 407, f. 1.* 1788.
On rotten wood, Porto Rico:—widely distributed.

### Family 2. **DIDYMIACEAE.**

#### 1. **DIDERMA** Persoon, Neues Mag. Bot. **1:** 89. 1794.

1. **Diderma effusum** (Schw.) Morg. Jour. Cin. Soc. **16:** 155. 1894.
*Physarum effusum* Schw. Trans. Am. Phil. Soc. II. **4:** 257. 1832.
On dead leaves of *Pandanus utilis* Bory, Porto Rico:—widely distributed.

2. **Diderma hemisphericum** (Bull.) Hornem. Fl. Danica **33:** 13. 1829.
*Reticularia hemispherica* Bull. Herb. Fr. *pl. 446, f. 1.* 1789.
On dead leaves, Porto Rico:—widely distributed.

3. **Diderma spumarioides** Fries, Syst. Myc. **3:** 104. 1829.
*Didymium spumarioides* Fries, Symb. Gast. 20. 1818.
On dead leaves and wood, Porto Rico:—West Indies; widely distributed.

#### 2. **DIDYMIUM** Schrad. Nov. Gen. Pl. 20. 1797.

1. **Didymium melanospermum** (Pers.) Macbr. N. Am. Slime-moulds ed. 1. 88. 1899.
*Physarum melanospermum* Pers. Neues Mag. Bot. 88. 1794.
St. Thomas:—widely distributed; not common in the tropics.

2. **Didymium nigripes** (Link) Fries, Syst. Myc. **3:** 119. 1829.
*Physarum nigripes* Link, Ges. Nat. Freunde Berlin Mag. **3:** 27. 1809.
On dead leaves and fruiting on living leaves of *Commelina longicaulis* Jacq. Host previously reported as *Commelina nudiflora* L., Porto Rico:—widely distributed and common.

3. **Didymium squamulosum** (Alb. & Schw.) Fries, Symb. Gast. 19. 1818.
*Diderma squamulosum* Alb. & Schw. Consp. Fung. 88. 1805.
On dead leaves, Porto Rico; St. Croix; St. Thomas:—widely distributed and abundant.

### Order 2. **STEMONITALES.**

| | |
|---|---|
| Columella branched throughout | Fam. 1. STEMONITACEAE. |
| Columella branched only from the top. | Fam. 2. LAMPRODERMACEAE. |

### Family 1. **STEMONITACEAE.**

#### 1. **COMATRICHA** Preuss, Linnaea **24:** 140. 1851.

1. **Comatricha irregularis** Rex, Proc. Acad. Phila. **1891:** 393. 1891.
On dead wood, Porto Rico:—continental North America.

2. **Comatricha longa** Peck, Ann. Rep. N. Y. State Mus. **43:** 24. 1890.
On dead wood, Porto Rico; St. Jan:—continental North America; the tropics.

3. **Comatricha typhoides** (Bull.) Rost. Versuch Mycet. 7. 1873.
*Trichia typhoides* Bull. Herb. Fr. *pl. 477, f. 2.* 1791.

On dead wood, Porto Rico; St. Croix; St. Thomas; St. Jan:—widely distributed and abundant.

2. **DIACHEA** Fries, Syst. Orb. Veg. 1: 143. 1825.

1. **Diachea bulbillosa** (Berk. & Br.) Lister, Jour. Bot. **36:** 165. 1898.

*Didymium bulbillosum* Berk. & Br. Jour. Linn. Soc. **14:** 84. 1873.

Porto Rico:—continental North America.

2. **Diachea leucopoda globosa** Lister, Mycetozoa, ed. 2. 118. 1911.

On dead leaves and grass. Reported on *Pitcairnia augustifolia* (Sw.) Redoute, Porto Rico:—not common. Listed by Seaver and Chardon under the species name without mentioning the variety.

3. **STEMONITIS** Gleditsch, Meth. Fung. 140. 1753.

1. **Stemonitis fusca** Roth, Mag. Bot. I. **2:** 26. 1787.

On dead wood and sugar cane trash, Porto Rico; St. Croix; St. Jan:—widely distributed and common.

*Stemonitis nigrescens* Rex, listed by Seaver and Chardon, was originally reported as *Stemonitis fusca* Roth. There is no record to indicate that it is other then the latter species.

2. **Stemonitis herbatica** Peck, Ann. Rep. N. Y. State Mus. **26:** 75. 1874.

On dead wood, Porto Rico:—widely distributed; abundant in the tropics.

3. **Stemonitis hyperopta** Meylan, Bull. Soc. Vaud. Sc. Nat. **52:** 97. 1918.

*Comatricha typhoides heterospora* Rex, Proc. Acad. Phila. **1893:** 367. 1893.

On mossy log, Porto Rico:—widely distributed.

4. **Stemonitis splendens** Rost. Sluz. Monog. 195. 1875.

On dead wood, Porto Rico; St. Thomas; St. Jan:—widely distributed; abundant in the tropics.

Family 2. **LAMPRODERMACEAE.**

1. **LAMPRODERMA** Rost. Versuch Mycet. 7. 1873.

1. **Lamproderma arcyrionema** Rost. Sluz. Monog. 208. 1875.

On herbaceous stalks, Porto Rico:—continental North America; West Indies; widely distributed.

2. **Lamproderma violaceum** (Fries) Rost. Versuch Mycet. 7. 1873.

*Stemonitis violacea* Fries, Syst. Myc. **3:** 162. 1829.

On mossy log, Porto Rico:—widely distributed.

Order 3. **CRIBRARIALES.**

Fructification of distinct and separate sporangia, the walls more or less reticulately perforate especially above. Fam. 1. CRIBRARIACEAE.

Fructification aethalioid.

The sporangia more or less tubular, often prismatic by mutual pressure, opening by rupture at the apex, the lateral walls entire. Fam. 2. TUBIFERACEAE.

The sporangia not well defined, their walls more or less perforate and frayed, forming a pseudo-capillitium. Fam. 3. RETICULARIACEAE.

Family 1. **CRIBRARIACEAE.**

1. **CRIBRARIA** Persoon, Neues Mag. Bot. **1:** 91. 1794.

1. **Cribraria intricata** Schrad. Nov. Gen. Pl. 7. 1797.

On dead wood, Porto Rico; St. Croix:—continental North America; Europe.

2. **Cribraria languescens** Rex, Proc. Acad. Phila. **1891**: 394. 1891.
St. Croix; St. Thomas:—West Indies; widely distributed.

3. **Cribraria microcarpa** (Schrad.) Pers. Syn. Fung. 190. 1801.
*Dictydium microcarpum* Schrad. Nov. Gen. Pl. 13. 1797.
On dead wood, Porto Rico:—continental North America; Europe.

4. **Cribraria splendens** (Schrad.) Pers. Syn. Fung. 191. 1801.
*Dictydium splendens* Schrad. Nov. Gen. Pl. 14. 1797.
St. Croix:—continental North America; Europe.

5. **Cribraria violacea** Rex, Proc. Acad. Phila. **1891**: 393. 1891.
On twigs, Porto Rico:—continental North America; West Indies; Europe.

2. **DICTYDIUM** Schrad. Nov. Gen. Pl. 11. 1797.

1. **Dictydium cancellatum** (Batsch) Macbr. N. Am. Slime-moulds ed. 1. 172. 1899.
*Mucor cancellatus* Batsch, Elench. Fung. Contin. **2**: 135. 1789.
On dead wood, leaves, and sugar cane stalks, Porto Rico; St. Croix; St. Thomas:—widely distributed.

Family 2. **TUBIFERACEAE.**

1. **TUBIFERA** Gmel. Syst. Nat. **2**: 1472. 1791.

1. **Tubifera ferruginosa** (Batsch.) Gmel. Syst. Nat. **2**: 1472. 1791.
*Stemonitis ferruginosa* Batsch, Elench. Fung. **2**: 261. 1786.
On rotten wood, Porto Rico; St. Croix:—widely distributed.

Family 3. **RETICULARIACEAE.**

1. **DICTYDIAETHALIUM** Rost. Versuch Mycet. 5. 1873.

1. **Dictydiaethalium plumbeum** (Schum.) Rost. Versuch Mycet. 5. 1873.
*Fuligo plumbea* Schum. Enum. Pl. Saell. **2**: 193. 1803.
St. Croix:—widely distributed.

2. **RETICULARIA** Bull. Herb. Fr. *pl. 446*. 1789.

1. **Reticularia lycoperdon** Bull. Herb. Fr. *pl. 446, f.* 4. 1789.
On old wood, Porto Rico:—widely distributed.

Order 4. **LYCOGALALES.**

Family 1. **LYCOGALACEAE.**

1. **LYCOGALA** Adanson, Fam. Pl. **2**: 7. 1763.

1. **Lycogala conicum** Pers. Syn. Fung. **1**: 159. 1801.
St. Croix:—continental North America; Europe; West Indies.

2. **Lycogala epidendrum** (L.) Fries, Syst. Myc. **3**: 80. 1829.
*Lycoperdon epidendrum* L. Sp. Pl. 1184. 1753.
On dead wood and sugar cane trash, Porto Rico; St. Croix; St. Jan:—widely distributed.

Order 5. **TRICHIALES.**

Capillitium plain, papillose or spinulose, often scanty, not netted. Fam. 1. PERICHAENACEAE.

Capillitium a distinct net, usually attached below to the sporangial wall; sculpturing various, not continuous spiral bands. Fam. 2. ARCYRIACEAE.

Capillitial threads typically free, sometimes more or less branched, forming a loose net attached below, characterized by definite spiral bands, or sometimes by scattered rings. Fam. 3. TRICHIACEAE.

## Family 1. **PERICHAENACEAE.**

### 1. **OPHIOTHECA** Currey, Quart. Mic. Jour. **2:** 240. 1854.

1. **Ophiotheca chrysosperma** Currey, Quart. Mic. Jour. **2:** 240. 1854.

St. Thomas:—widely distributed. Reported as *Perichaena chrysosperma* (Currey) Lister.

2. **Ophiotheca Wrightii** Berk. & Curt. Jour. Linn. Soc. **10:** 349. 1869.

On dead wood, Porto Rico:—continental North America.

### 2. **PERICHAENA** Fries, Symb. Gast. 11. 1817.

1. **Perichaena depressa** Libert, Pl. Crypt. Ard. IV. no. 378. 1837.

St. Jan:—widely distributed.

## Family 2. **ARCYRIACEAE.**

### 1. **ARCYRIA** Weber; Wigg. Pr. Fl. Holsat. 109. 1780.

1. **Arcyria cinerea** (Bull.) Pers. Syn. Fung. 184. 1801.

*Trichia cinerea* Bull. Herb. Fr. *pl. 477, f. 3.* 1789.

On dead wood and sugar cane trash, Porto Rico; St. Croix; St. Thomas:—widely distributed.

2. **Arcyria denudata** (L.) Wettstein, Verh. Zool. Bot. Ges. Wien. 585. 1885–6.

*Clathrus denudatus* L. Sp. Pl. 1179. 1753.

On dead wood and sugar cane trash, Porto Rico; St. Croix; St. Jan:—widely distributed. *Arcyria punicea* Pers. reported from the Schwanecke collection, Porto Rico, is synonymous with *Arcyria denudata* (L.) Wettstein.

3. **Arcyria incarnata** Pers. Obs. Myc. **1:** 58. 1796.

*Stemonitis incarnata* Pers.; Gmel. Sys. Nat. **2:** 1467. 1791.

On dead wood, Porto Rico; Virgin Islands:—widely distributed in temperate regions but rare in the tropics.

4. **Arcyria nutans** (Bull.) Grev. Fl. Edin. 455. 1824.

*Trichia nutans* Bull. Herb. Fr. *pl. 502, f. 3.* 1791.

Virgin Islands:—widely distributed.

## Family 3. **TRICHIACEAE.**

### 1. **HEMITRICHIA** Rost. Versuch Mycet. 14. 1873.

1. **Hemitrichia clavata** (Pers.) Rost. Versuch Mycet. 14. 1873.

*Trichia clavata* Pers. Neues Mag. Bot. **1:** 90. 1794.

On dead wood and twigs, Porto Rico; St. Croix; St. Thomas; St. Jan:—widely distributed in temperate and tropical regions.

2. **Hemitrichia serpula** (Scop.) Rost. Versuch Mycet. 14. 1873.

*Mucor serpula* Scop. Fl. Carn. **2:** 493. 1772.

On decaying stems, Porto Rico; St. Croix; St. Thomas; St. Jan:—widely distributed; abundant in the tropics.

3. **Hemitrichia vesparia** (Batsch) Macbr. N. Am. Slime-moulds ed. 1. 203. 1899.

*Lycoperdon vesparium* Batsch, Elench. Fung. **2**: 253. 1786.

On dead wood, Porto Rico; St. Croix:—continental North America; Europe; the tropics.

2. **TRICHIA** Haller, Hist. Helv. **3**: 114. 1768.

1. **Trichia persimilis** Karst. Not. Saell. Fenn. Forh. **9**: 353. 1868.

St. Croix:—widely distributed in temperate regions but rare in the tropics.

# THE MYXOPHYCEAE OF PORTO RICO AND THE VIRGIN ISLANDS

By Nathaniel Lyon Gardner

## INTRODUCTION

In a previous paper, entitled "New Myxophyceae from Porto Rico," I published two hundred and fourteen new species, varieties, and forms.[1] These, as was stated in that paper, were principally from a collection made by Dr. N. Wille in Porto Rico in 1914 and 1915.[2] His collection consisted of over two thousand numbered specimens taken from almost every conceivable habitat except salt water. This report covers the entire collection of Dr. Wille along with all other available miscellaneous collections of fresh-water species known to the author, and in addition extensive collections of marine species made at various times in the last quarter of a century, from the waters bordering the island, by Dr. Marshall A. Howe, and by Dr. F. Børgesen among the Virgin Islands (Danish West Indies).

From all of these collections a total of fifty-two genera and three hundred and seventy-seven species are reported. The region seems to be especially rich in species of this group of plants, at least so large a number of species, distributed among so many genera, has never been reported from any similar area on the globe.

The collections furnish an excellent example of the extreme adaptability of the group as a whole to a very wide range of environmental conditions, especially regarding different amounts of moisture, different degrees of heat, and conditions of food supply. Those inhabiting rocks are subjected to extreme dessication a large part of the time; terrestrial and arboreal species less so, while those inhabiting water are submerged almost continuously.

The temperatures in which they thrive range from the fairly constant temperatures of the waters of lakes, rivers, and the ocean, through the extremely variable degrees to which terrestrial, arboreal, and saxicolous species are subjected, finally to those in-

[1] Memoirs New York Botanical Garden 7: 1–95, *pl. 1–23*. 1927.

[2] Professor Wille's narrative of his Porto Rican expedition may be found in the Journal of The New York Botanical Garden for July, 1915 (16: 132–146). In Dr. Gardner's present paper the numbers cited are those of Professor Wille's collecting unless otherwise indicated. His collection was divided, one part being taken by him to Norway and the other being left with The New York Botanical Garden. Dr. Gardner's studies have been based upon both the dried and fluid-preserved material at the Garden and, in addition, through the courtesy of Dr. Henrik Printz, the dried specimens of Porto Rican Myxophyceae taken to Norway by Professor Wille were returned to the Botanical Garden for Dr. Gardner's use.—[Ed.]

habiting waters of hot springs whose temperatures range to near the boiling point.

Arboreal species, especially those growing on leaves, are moistened by rain water only, which must contain but extremely small quantities of mineral food. At the other end of the series, as regards concentration of minerals, may be mentioned those which thrive in pools along the seashore in which the water is almost saturated.

The species as treated here are arranged under three orders.

1. Plants unicellular, existing singly or associated into more or less definite colonies of various shapes and sizes, usually with a gelatinous or mucilaginous tegument. Multiplication by simple division. Akinetes formed in some genera ..... Order 1. CHROOCOCCALES. Page 250.

1. Plants unicellular, or rarely multicellular, existing singly or associated into variously shaped colonies, more rarely filamentous. Multiplication by simple division and by formation of gonidia in a part or in all of the cells, then called gonidangia ... Order 2. CHAMAESIPHONALES. Page 264.

1. Plants distinctly multicellular, with simple or branched filaments, the branching being either false or true, existing singly or few to many associated within a common sheath, or tegument. Multiplication by formation of two- to many-celled hormogonia. Hypnospores formed in several genera ..... Order 3. HORMOGONALES. Page 265.

## Order 1. CHROOCOCCALES

### Family 1. CHROOCOCCACEAE

Characters same as the order.

1. Cells single or in colonies, division in 1 plane ..... 2.
1. Cells forming plate-like colonies, division in 2 planes perpendicular to each other ..... 5. *Merismopedia.*
1. Cells forming more or less gelatinous colonies, division in 3 planes ..... 8.
2. Cells single or at least a few in a colony ..... 3.
2. Cells forming distinct colonies ..... 6.
3. Cells cylindrical, with rounded ends ..... 4.
3. Cells spherical or fusiform and somewhat curved ..... 5.
4. Cells single or at most in pairs, small, and thin-walled ... 2. *Synechococcus.*
4. Cells single, in pairs, or short, falsely branched filaments, and thick-walled ..... 4. *Chroothece.*
5. Cells spherical, usually separating immediately after division. 1. *Synechocystis.*
5. Cells fusiform and more or less curved ..... 3. *Dactylococcopsis.*
6. Cells discoid, forming short, monosiphonous filaments ... 16. *Cyanothrix.*
6. Cells forming gelatinous, definite or indefinite colonies ..... 7.

7. Colonies gelatinous, definite in shape and size, thick, firm, and more or less laminated. . . . . 11. *Glocothece.*
7. Colonies indefinite in shape and size, homogeneous. . . . . 7. *Aphanothece.*
8. Cells spherical, with gelatinous tegument, forming colonies of indefinite shape and size. . . . . 6. *Aphanocapsa.*
8. Cells forming smaller colonies of definite shape and size. . . . . 9.
9. Cells free-floating or forming loose pulverulent or gelatinous layers. . . . . 10.
9. Cells attached to a substratum, forming cushion-shaped, lobular, at times cavernous colonies or layers of indefinite expansion. . . . . 14.
10. Colonies with resting spores. . . . . 11.
10. Colonies without resting spores. . . . . 12.
11. Colonies spherical to subspherical. Cells spherical to angular by mutual pressure. Colonial tegument gelatinous. Cells all changed into resting spores. . . . . 14. *Anacystis.*
11. Colonies more or less cubical. Cells mostly angular from mutual pressure. Colonial tegument firm and membranaceous. Cells changing to akinetes. . . . . 15. *Endospora.*
12. Cells near the surface of spherical colonies, leaving the center free. . . . . 8. *Coelosphaerium.*
12. Cells not arranged on the surface of the colony. . . . . 13.
13. Cells usually few in a colony, more or less angular after division, usually with a homogeneous firm tegument. . . . . 9. *Chroococcus.*
13. Cells from few to very many in a colony, soon becoming spherical after division and usually with laminated tegument. . . . . 10. *Gloeocapsa.*
14. Colonies cushion-shaped, more or less gelatinous, with cells arranged in more or less definite, radiating rows. . . . . 13. *Placoma.*
14. Colonies usually in a more or less expanded layer, firmly attached and with cells in radiating, false-branched, and somewhat gloeocapsoid masses. . . . . 12. *Entophysalis.*

### 1. **SYNECHOCYSTIS** Sauv. Bull. Soc. Bot. France **39:** cxv. 1892.

Type species, *Synechocystis aquatilis.*

1. Cells 1 $\mu$ or less diam. . . . . 1. *S. primigenia.*
1. Cells 2 $\mu$ or more diam. . . . . 2.
2. Cells 3–4 $\mu$ diam. . . . . 2. *S. Willei.*
2. Cells 5–6 $\mu$ diam. . . . . 3. *S. aquatilis.*

1. **Synechocystis primigenia** Gardner, Mem. N. Y. Bot. Gard. **7:** 2, *pl. 1, f. 1.* 1927.

On limestone between Hatillo and Arecibo, *1377b;* on the wall of a church, Sabana Grande, *953b.* Type locality, near Arecibo.

2. **Synechocystis Willei** Gardner, Mem. N. Y. Bot. Gard. **7:** 2, *pl. 1, f. 2.* 1927.

In a pool about four kilometers north of Mayaguez, *1329b.* Type locality, near Mayaguez.

3. **Synechocystis aquatilis** Sauv. Bull. Soc. Bot. France **39:** cxvi. 1892.

In a concrete basin near the Hot Springs, Coamo Springs, 378; in a little stream near Humacao, 648. Type locality, Algeria.

### 2. **SYNECHOCOCCUS** Naeg. Gatt. Einz. Alg. 56. 1849.

Type species, *Synechococcus elongatus.*

1. Cells 1–2 $\mu$ diam., 4.5–5.5 $\mu$ long. . . . . 1. *S. elongatus.*
1. Cells 6–7 $\mu$ diam., 12–14 $\mu$ long. . . . . 2. *S. intermedius.*
1. Cells 7–15 $\mu$ diam., 14–26 $\mu$ long. . . . . 3. *S. aeruginosus.*

1. **Synechococcus elongatus** Naeg. Gatt. Einz. Alg. 56. 1849.

An occasional cell of what seems to be this species, was noted in various collections. Type locality, Zürich.

2. **Synechococcus intermedius** Gardner, Mem. N. Y. Bot. Gard. **7:** 3, *pl. 1, f. 3.* 1927.

On the bark of trees, Caguas, *439b;* on old leaves in a stream west of Humacao, *581a, 602;* east of Humacao, *640;* on bark near Guanica, *1841c.* Type locality, Caguas.

3. **Synechococcus aeruginosus** Naeg. Gatt. Einz. Alg. 56. 1849.

On fallen leaves in the stream west of Humacao, *581;* on shaded rocks at the "Campo," Maricao, *1235;* in a water basin west of the Experiment Station, Rio Piedras, *1965b.* Type locality, Greece.

3. **DACTYLOCOCCOPSIS** Hansg. Notarisia **3:** 590. 1888.

Type species, *Dactylococcopsis rupestris.*

1. **Dactylococcopsis arcuata** Gardner, Mem. N. Y. Bot. Gard. **7:** 3. *pl. 1, f. 4.* 1927.

On the bark of a tree trunk, Caguas, *439e.* Type locality, Caguas.

4. **CHROOTHECE** Hansg. Oest. Bot. Zeitsch. **34:** 314, *pl. 1, f. 4–8.* 1884 (*nomen nudum*). Bot. Notis. **1884:** 128. 1884.

Type species, *Chroothece Richteriana.*

1. Cells (without tegument) 5.8–6.2 μ diam. ,18–24 μ long.....1. *C. Willei.*
1. Cells 12–18 μ diam., up to 2 times as long.....2. *C. Richteriana.*
1. Cells attached to branched stalks, 1.5 μ × 3 μ diam.....3. *C. cryptarum.*

1. **Chroothece Willei** Gardner, Mem. N. Y. Bot. Gard. **7:** 3, *pl. 1, f. 5.* 1927.

On limestone at Hato Arriba, Arecibo, *1410.* Type locality, Hato Arriba.

2. **Chroothece Richteriana** Hansg. Bot. Notis. **1884:** 128. 1884.

On walls near San Juan, *19, 67, 92, 130d, 131;* on a wall by the Hotel Nava, Santurce, *54, 55, 143;* on a wall on the south side of the reservoir near the Experiment Station, Rio Piedras, *214b;* on a wall by the baths, Coamo Springs, *254, 262;* on walls, damp earth and rocks, Coamo Springs, *271, 272 I and II, 289c, 295a, 296a, 302, 303, 315a, 325, 1861c;* on limestone between Hatillo and Arecibo, *1371, 1476a, 1478;* on rocks by Utuado, *1502;* on a wall, Fort San Cristobal, San Juan, *1991a, 1998, 2003, 2006, 2017a, 2020, 2021a, 2023.* Type locality, Bohemia.

3. **Chroothece cryptarum** Farlow, *in* Collins, Holden, and Setchell, Phyc. Bor. Amer. (Exsicc.) no. 752.

On a shaded wall of a sluice-way, in the upper littoral belt, San Juan. *Howe, 2130.* Type locality, Bermuda.

4. **Chroothece** sp.

No. 761 contains a few single cells of a plant, apparently undescribed, which seems to belong to *Chroothece.* The cells are ovoid or ellipsoid, 60–80 μ, up to 125 μ diam., with a dark blue-green protoplast and thick, hyaline cell-wall. The peculiar chromatophore and pyrenoid, supposed to be characteristic of the genus, could not be made out. No indication of cell division was observed. The material may be a gigantic species of *Chroococcus.*

5. **MERISMOPEDIA** Meyen, Arch. f. Naturgesch. **5²:** 67. 1839. (*nomen nudum*). Kütz. Linnaea **17:** 84. 1843.

Type species *Merismopedia glauca,* based on *Gonium glaucum* Ehrenberg.

1. Cells spherical, up to 16 in a family.....2.
1. Cells subcylindrical before division, up to 560 in a family.....3. *M. Willei.*
2. Cells 1.3–2 μ diam.....1. *M. tenuissima.*
2. Cells 3–6 μ diam.....2. *M. glauca.*

1. **Merismopedia tenuissima** Lemm. Bot. Centr. **75**: 154. 1898.

With other algae in Laguna Tortuguero, *831f;* in a pool about four kilometers north of Mayaguez, *1326a, 1327a, 1329d.* Type locality, "Baselitz bei Kamenz."

2. **Merismopedia glauca** (Ehr.) Naeg. Gatt. Einz. Alg. 55, *pl. 1D, f. 1. 1849.*

*Gonium glaucum* Ehrenberg, Infusionth. 56, *pl. 3, f. 5.* 1838. Type locality, Wismer, Germany.

In a warm stream near the Hot Spring, Coamo Springs, *884b.*

3. **Merismopedia Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 3, *pl. 1, f. 6.* 1927.

In a pool about four kilometers north of Mayaguez, *1310a.* Type locality, near Mayaguez.

6. **APHANOCAPSA** Naeg. Gatt. Einz. Alg. 52. 1849.

Type species, *Aphanocapsa parietina.*

1. Cell contents pale aeruginous ..... 2.
1. Cell contents varying from aeruginous to some other color ..... 4.
2. Cells less then 3 $\mu$ diam. ..... 1. *A. intertexta.*
2. Cells more then 3 $\mu$ diam. ..... 3.
3. Cells 3–4 $\mu$ diam., closely crowded, tegument very thin ..... 3. *A. Richteriana.*
3. Cells about 6 $\mu$ diam., less crowded, tegument scarcely visible. 5. *A. virescens.*
4. Cell contents aeruginous to violet, variable, 2–7 $\mu$ thick ..... 2. *A. violacea.*
4. Cell contents pale aeruginous to greenish gray, 3.5–4.5 $\mu$. 4. *A. Richteriana* var. *major.*

1. **Aphanocapsa intertexta** Gardner, Mem. N. Y. Bot. Gard. **7**: 4. *pl. 1, f. 7.* 1927.

On stones west of Humacao, *573b;* on red earth on the road-side north of Maricao, *1250a;* on rocks in Arroyo de los Corchos, *1718.* Type locality, Arroyo do los Corchos.

2. **Aphanocapsa violacea** Grun.; Rabenhorst, Fl. Eur. Alg. **2**: 51. 1865.

In leakage of the warm water on the rocks, Coamo Springs, *367a.* Type locality, Neuhaus, Austria.

3. **Aphanocapsa Richteriana** Hieron.; Hauck and Richter, Phyc. Univ. no. 485. 1892.

On damp earth, Coamo Springs, *277;* on a wall of the bridge, Caguas, *459a, 460c;* on rocks in the stream, Fajardo, *693a;* in an iron water container at the Playa, Fajardo, *699;* on wood and on blocks of lava in a primeval forest, Hacienda Catalina, Palmer, *752, 755d, 765;* on bark at Hacienda, Laguna Tortuguero, *864a;* in a pool of water four kilometers north of Mayaguez, *1316d, 1327, 1329;* on bark in the valley of a stream, Coamo Springs, *1905c;* in a reservoir west of the Experiment Station, Rio Piedras, *1946b;* on a water pipe near a stream, Maricao, *1147.* Type locality, Gross Wilkau, Silesia.

4. **Aphanocapsa Richteriana major** Gardner, Mem. N. Y. Bot. Gard. **7**: 4, *pl. 1, f. 9.* 1927.

On soil in the primeval forest near Hacienda Catalina, Palmer, *754a.* Type locality, Palmer.

5. **Aphanocapsa virescens** (Hassall) Rab. Fl. Eur. Alg. **11**: 48. 1865.

*Sorosporium virescens* Hassall, Freshwater Alg. 310, *pl. 78, f. 8a.* 1857.

In a pool about four kilometers north of Mayaguez, *1318.* Type locality, Scotland.

7. **APHANOTHECE** Naeg., Gatt. Einz. Alg. 59. 1849.

Type species, *Aphanothece microscopica.*

1. Cell tegument hyaline ..... 2.

1. Cell tegument not hyaline, or hyaline varying to some other color.....4.
   2. Cells up to 1 $\mu$ diam., 2 times as long.....1. *A. bacilloidea.*
   2. Cells over 1 $\mu$ diam.....3.
3. Cells 2.5–3 $\mu$ diam., 4.5–6 $\mu$ long.....3. *A. conferta.*
3. Cells 3.5 $\mu$ diam., 4–4.5 $\mu$ long.....4. *A. conferta brevis.*
   4. Cells more than 2 $\mu$ diam.....6.
   4. Cells 2 $\mu$ diam. or less.....5.
5. Cells 1–2 $\mu$ diam., 2–3 times as long; tegument hyaline to yellow. 2. *A. saxicola.*
5. Cells 1–1.4 $\mu$ diam., 2–2.4 times as long; tegument opalescent. 5. *A. opalescens*
   6. Tegument hyaline; cell contents hyaline, homogeneous. 6. *A. microscopica.*
   6. Tegument yellowish brown; contents yellowish, granular. 7. *A. microscopica granulosa.*

1. **Aphanothece bacilloidea** Gardner, Mem. N. Y. Bot. Gard. **7**: 5, *pl. 1, f. 10.* 1927.

In depressions in the limestone at Hato Arriba, Arecibo, *1407a;* on limestone between Hatillo and Arecibo, *1378;* in an underground passage at Fort San Cristobal, San Juan, *1989c.* Type locality, Arecibo.

2. **Aphanothece saxicola** Naeg. Gatt. Einz. Alg. 60. 1849.

In depressions in the limestone between Arecibo and Utuado, *1473.* Type locality, Zürich.

3. **Aphanothece conferta** P. Richter, *in* Hauck and Richter, Phyc. Univ. no. 487. 1892.

On damp rocks and earth, Coamo Springs, *287b, 325a;* on the garden wall, Hotel Paris, Mayaguez, *983, 991b;* on a wall at the Experiment Station, Mayaguez, *973;* on rocks, Maricao, *1036;* on bark above Rio Maricao, *1127;* on damp rocks ten kilometers north of Utuado, *1527a;* on limestone, Hato Arriba, near Arecibo, *1397f;* on rocks between Utuado and Adjuntas, *1640b, 1650, 1652, 1653;* on bark among limestone rocks, Guanica, *1841;* on the walls in Fort San Cristobal, San Juan, *1988.* Type locality, Oschaz, Germany.

4. **Aphanothece conferta brevis** Gardner, Mem. N. Y. Bot. Gard. **7**: 5. 1927.

On a water pipe by a stream, Maricao, *1147;* on rocks between Utuado and Adjuntas, *1635a.* Type locality, Maricao.

5. **Aphanothece opalescens** Gardner, Mem. N. Y. Bot. Gard. **7**: 5, *pl. 1, f. 8.* 1927.

With other Myxophyceae at La Chiquita near Maricao, *1144e.* Type locality, near Maricao.

6. **Aphanothece microscopica** Naeg. Gatt. Einz. Alg. 59. 1849.

In Laguna Tortuguero, *828;* at the "Campo" south of Maricao, *1290.* Type locality, Zürich, Switzerland.

7. **Aphanothece microscopica granulosa** Gardner, Mem. N. Y. Bot. Gard. **7**: 5, *pl. 1, f. 11.* 1927.

On rocks at Penuelas, *1848a.* Type locality, Penuelas.

8. **COELOSPHAERIUM** Naeg. Gatt. Einz. Alg. 54. 1849.

Type species, *Coelosphaerium Kuetzingianum.*

1. **Coelosphaerium Kuetzingianum** Naeg. Gatt. Einz. Alg. 54. 1849.

In Laguna Tortuguero, *831d.* Type locality, Zürich, Switzerland.

## 9. **CHROOCOCCUS** Naeg. Gatt. Einz. Alg. 45. 1849.

Type species, *Chroococcus rufescens.*

1. Tegument hyaline ..... 3.
1. Tegument not hyaline, except very early ..... 2.
2. Tegument yellowish red; cells 8–10 μ by 10–16 μ diam. 7. *C. polyhedriformis.*
2. Tegument purplish violet; cells 1.5–2 μ diam ..... 15. *C. muralis.*
3. Tegument more or less lamellose ..... 4.
3. Tegument for the most part homogeneous ..... 9.
4. Cells 8–13 μ diam.; contents glaucous ..... 8. *C. limneticus.*
4. Cells 13 μ or more diameter ..... 5.
5. Cells 50–58 μ diam ..... 1. *C. giganteus.*
5. Cells less than 50 μ diam ..... 6.
6. Cells 30–40 μ diam.; colonies of four, 80–100 μ diam. 2. *C. giganteus occidentalis.*
6. Cells 40 μ or less in diam ..... 7.
7. Cell contents olive green, 14–18 μ diam ..... 5. *C. turgidus violaceus.*
7. Cell contents bright aeruginous ..... 8.
8. Cells 25–40 μ diam ..... 3. *C. turgidus.*
8. Cells 15–20 μ diam ..... 4. *C. turgidus subnudus.*
9. Cell contents various shades of aeruginous, ..... 10.
9. Cell contents in part aeruginous early, later becoming some other color ..... 15.
10. Cells 13 μ or more diam ..... 6. *C. turgidus uniformis*
10. Cells less then 13 μ diam ..... 11.
11. Cells more than 6 μ diam ..... 12.
11. Cells less then 6 μ diam ..... 13.
12. Cells bright aeruginous, 8–9 μ diam.; colonies of four, 15–18 μ diam ..... 16. *C. mediocris.*
12. Cells pale aeruginous, 7–9 μ diam.; colonies of four, 10–12 μ diam ..... 11. *C. constrictus.*
13. Cells over 3 μ diam.; colonies of four, 8–10 μ diam ..... 14. *C. aeruginosus.*
13. Cells less than 3 μ diam ..... 14.
14. Cells 1–1.5 μ diam.; colonies of four, 4.8–5.2 μ diam.; tegument very thin ..... 18. *C. minutissimus.*
14. Cells 1.5–2 μ diam.; colonies of four, 5–6.5 diam ..... 15. *C. muralis.*
14. Cells 1.8–2.5 μ diam.; colonies of four, 6–7 diam ..... 17. *C. cubicus.*
15. Cells 4.5 μ diam., contents glaucous; colonies of four, 12 μ diam. 13. *C. sabulosus.*
15. Cells 4–7.5 μ diam., contents aeruginous to yellow; colonies spherical 12. *C. helveticus.*
15. Cells 6–6.5 μ diam., contents purplish drab or gray; colonies of four, 16–19 μ diam ..... 10. *C. subsphericus.*
15. Cells 8–10 μ diam., contents olive-green; colonies of four 18–20 μ diam ..... 9. *C. heanogloios.*

1. **Chroococcus giganteus** W. West, Jour. R. M. S. **1892**[2]: 741, *pl. 10, f. 59–61.* 1892.

In Laguna Tortuguero, *829e.* Type locality, "Bowness," England.

2. **Chroococcus giganteus occidentalis** Gardner, Mem. N. Y. Bot. Gard., **7:** 8, *pl. 2, f. 17.* 1927.

In Laguna Tortuguero with other Myxophyceae, *849b.* Type locality, Laguna Tortuguero.

3. **Chroococcus turgidus** (Kuetz.) Naeg. Gatt. Einz. Alg. 45. 1849.

*Protococcus turgidus* Kuetz. Tab. Phyc. **1:** *pl. 6, f. 1.* 1845.

On the bottom of a warm stream by the Hot Springs, Coamo Springs, *384a;* in Laguna Tortuguero, *831b;* in a pool about four kilometers south of Mayaguez, *1316;* on rocks between Utuado and Adjuntas, *1640g;* in a ditch near Ponce, *1670c.* Type locality not designated.

4. **Chroococcus turgidus subnudus** Hansg. Prod. **2:** 161. 1893.

In a pool about four kilometers south of Mayaguez, *1318a.* Type locality, in the vicinity of Prague.

5. **Chroococcus turgidus violaceus** W. West, Jour. R. M. S. **1892**[2]: 741. 1892.

On damp earth, Coamo Springs, *288, 304;* on old wood in primeval forest near Hacienda Catalina, Palmer, *755a.* Type locality, "foot of Bow Fell," English Lakes.

6. **Chroococcus turgidus uniformis** Gardner, Mem. N. Y. Bot. Gard. **7:** 7. 1927.

On damp rocks, Coamo Springs, *287a.* Type locality, Coamo Springs.

7. **Chroococcus polyhedriformis** Schmidle, Engl. Bot. Jahrb. **30:** 241, *pl. 4, f. 1.* 1901.

On a wall near Hotel Nova, Santurce, *56.* Type locality, Langenburg on Lake Nyassa, Africa.

8. **Chroococcus limneticus** Lemm. Bot. Centralb. **76:** 153. 1898.

On a stone wall and on damp earth, Coamo Springs, *303a, 304a.* Type locality not definitely specified.

9. **Chroococcus heanogloios** Gardner, Mem. N. Y. Bot. Gard. **7:** 9, *pl. 2, f. 20.* 1927.

On rocks about ten kilometers north of Utuado, *1537c.* Type locality, near Utuado.

10. **Chroococcus subsphericus** Gardner, Mem. N. Y. Bot. Gard. **7:** 6, *pl. 2, f. 13,* 1927.

On a wall by the Hot Springs, Coamo Springs, *402a, 403a.* Type locality, Coamo Springs.

11. **Chroococcus constrictus** Gardner, Mem. N. Y. Bot. Gard. **7:** 8, *pl. 2, f. 19.* 1927.

In a water basin west of the Experiment Station, Rio Piedras, *1965.* Type locality, Rio Piedras.

12. **Chroococcus helveticus** Naeg. Gatt. Einz. Alg. 46, *pl. 1.* 1849.

On rocks between Utuado and Adjuntas, *1640c.* Type locality, Lucerne.

13. **Chroococcus sabulosus** (Menegh.) Hansg. Prod. **2:** 164. 1893.

*Protococcus sabulosus* Menegh. Kuetz. Tab. Phyc. **1:** *pl. 2.* 1845.

On damp rocks about twelve kilometers north of Utuado, *1512;* on rocks near Arroyo de los Corchos, *1695;* on rocks about twenty kilometers north of Ponce, *1753.* Type locality, northern Italy.

14. **Chroococcus aeruginosus** Gardner, Mem. N. Y. Bot. Gard. **7:** 7, *pl. 2, f. 16.* 1927.

On wood by the Hot Springs, Coamo Springs, *382a.* Type locality, Coamo Springs.

15. **Chroococcus muralis** Gardner, Mem. N. Y. Bot. Gard. **7:** 7, *pl. 2, f. 15.* 1927.

On a wall, Coamo Springs, *301.* Type locality, Coamo Springs.

16. **Chroococcus mediocris** Gardner, Mem. N. Y. Bot. Gard. **7:** 6, *pl. 2, f. 14.* 1927.

Among other algae, Laguna Tortuguero, *831h.* Type locality, Laguna Tortuguero.

17. **Chroococcus cubicus** Gardner, Mem. N. Y. Bot. Gard. **7:** 5, *pl. 1, f. 12.* 1927.

On a fence, on palm trees and on the wall of a bridge, Santurce, *2, 3, 4a, 5, 142, 143a;* on walls near San Juan, *66a, 92b;* in Fort San Cristobal, San Juan, *1993a, 1999, 2004c, 2007, 2011, 2021c;* on a concrete basin near the Experiment Station, Rio Piedras, *177;* on walls and rocks, Coamo Springs, *254a, 307a, 313, 402b, 409b;* on rocks and the walls of the bridge, Juan Martin, Fajardo, *682a, 713, 717a, 734a, 736a;* on old wood in a primeval forest, Hacienda Catalina, Palmer, *755;* on trunks of palms at the Hacienda, Laguna Tortuguero, *871, 872;* on blocks of lava, Sabana Grande, *923a;* on a wall, Hotel Paris, Mayaguez, *982b;* on walls, Maricao, *1050, 1060, 1061;* on rocks, Hacienda Holm, Mayaguez, *1190;* on rocks and walls near Arecibo, *1337, 1363, 1368, 1372b, 1457, 1462;* on the wall of a bridge and on rocks, Guanica, *1838, 1841a.* Type locality, Santurce.

18. **Chroococcus minutissimus** Gardner, Mem. N. Y. Bot. Gard. **7:** 8, *pl. 2, f. 18.* 1927.

In a waterfall between Arecibo and Utuado, *1458b.* Type locality, near Arecibo.

### 10. **GLOEOCAPSA** Kuetz. Phyc. Gen. 173. 1843.

Type species, *Gloeocapsa montana.*

1. Tegument always hyaline ..... 2.
1. Tegument more or less colored (except *G. cartilaginea minor*) ..... 6.
2. Tegument homogeneous ..... 3.
2. Tegument homogeneous or more or less lamellose ..... 4.
3. Cells 1.5–2.5 μ diam.; tegument cartilaginous ..... 2. *G. cartilaginea.*
3. Cells 3 μ diam. ..... 10. *G. livida minor.*
4. Cells less than 5 μ diam. ..... 5.
4. Cells 5.8–6.2 μ diam., bright aeruginous ..... 11. *G. ovalis.*
5. Cells 1.1–1.3 μ diam., secreting calcium carbonate ..... 4. *G. calcicola.*
5. Cells 3–4.5 μ diam. ..... 7. *G. quaternata*
6. Tegument distinctly lamellose ..... 8. *G. quaternata major.*
6. Tegument homogeneous ..... 7.
7. Cells 2–2.3 μ diam., protoplast yellowish green ..... 5. *G. sphaerica.*
7. Protoplast aeruginous ..... 8.
8. Cells less than 1.5 μ diam. ..... 9.
8. Cells more than 1.5 μ diam. ..... 10.
9. Cells 0.9–1.2 μ diam., up to 250 in a colony; tegument mucilaginous. 1. *G. acervata.*
9. Cells 0.8–1.2 μ diam.; tegument cartilaginous: ..... 3. *G. cartilaginea minor.*
10. Cells 1.5–2 μ diam.; tegument yellow to brown ..... 9. *G. fuscolutea.*
10. Cells 3.5 μ diam.; tegument violet to rose-colored ..... 6. *G. violacea.*

1. **Gloeocapsa acervata** Gardner, Mem. N. Y. Bot. Gard. **7:** 10, *pl. 2, f. 22.* 1927.

On limestone between Hatillo and Arecibo, *1390, 1393;* on limestone near Hato Arriba, Arecibo, *1425.* Type locality, near Arecibo.

2. **Gloeocapsa cartilaginea** Gardner, Mem. N. Y. Bot. Gard, **7**: 9, *pl. 2, f. 21.* 1927.

On red soil near Maricao, *1025.* Type locality, near Maricao.

3. **Gloeocapsa cartilaginea minor** Gardner, Mem. N. Y. Bot. Gard. **7**: 9. 1927.

On limestone between Hatillo and Arecibo, *1377;* in depressions in limestone rock, Hato Arriba, Arecibo, *1428.* Type locality, near Arecibo.

4. **Gloeocapsa calcicola** Gardner, Mem. N. Y. Bot. Gard. **7**: 11, *pl. 2, f. 24.* 1927.

On a wall at Hotel Nava, Santurce, *54b, 55a;* on limestone at Hacienda, Laguna Tortuguero, *866.* Type locality, Laguna Tortuguero.

5. **Gloeocapsa sphaerica** Gardner, Mem. N. Y. Bot. Gard. **7**: 12, *pl. 3, f. 26.* 1927.

On limestone between Arecibo and Utuado, *1482a.* Type locality, near Arecibo.

6. **Gloeocapsa violacea** (Corda) Rab. Fl. Eur. Alg. **2**: 41. 1865.

*Protococcus violaceus* Corda, *in* Sturm. D. Fl. **2**[18]: 2. 1829.

In a rivulet by a stream near Maricao, *1155c.*

7. **Gloeocapsa quaternata** (Bréb.) Kuetz. Tab. Phyc. **1**: *pl. 20, f. 1.* 1845.

*Coccochloris quaternata* Bréb.; Rab. Fl. Eur. Alg. **2**: 37. 1865.

On a garden wall, Hotel Paris, Mayaguez, *985;* on rocks, Arroyo de los Corchos, *1703;* on a wall in Fort San Cristobol, San Juan, *2023a.* Type locality, western Europe, but not definitely designated.

8. **Gloeocapsa quaternata major** Gardner, Mem. N. Y. Bot. Gard. **7**: 12. *pl. 3, f. 27.* 1927.

On the wall of a cemetery, San Juan, *131a.* Type locality, San Juan.

9. **Gloeocapsa fuscolutea** (Naeg.) Kuetz. Sp. Alg. 224. 1849.

*Gloeocapsa ambigua-fuscolutea* Naeg. Gatt. Einz. Alg., 50. 1849.

On a wall at Caleta de San Juan, San Juan, *66g;* on a church wall, Sabana Grande, *961b.*

10. **Gloeocapsa livida minor** Gardner, Mem. N. Y. Bot. Gard. **7**: 10, *pl. 2, f. 23.* 1927.

On limestone, Hato Arriba, Arecibo, *1397a, 1406a.* Type locality, Arecibo.

11. **Gloeocapsa ovalis** Gardner, Mem. N. Y. Bot. Gard. **7**: 11, *pl. 2, f. 25.* 1927.

On limestone between Utuado and Adjuntas, *1640.* Type locality, near Utuado.

### 11. **GLOEOTHECE** Naeg. Gatt. Einz. Alg. 57. 1849.

Type species, *Gloeothece linearis.*

1. Tegument lamellose ..... 2.
1. Tegument homogeneous ..... 4.
2. Colonies containing up to 8 cells ..... 3.
2. Colonies containing up to 32 cells; tegument dark yellow; cells 4.5–5.5 $\mu$ diam., 1.5–2.5 times as long ..... 9. *G. fuscolutea.*

3. Cells 3.6–4 $\mu \times 7$–7.5 $\mu$; colonies of four, 16–18 $\mu$ diam.; tegument hyaline.....7. *G. interspersa.*
3. Cells 3–5 $\mu \times 8$–10 $\mu$; colonies of four, up to 30 $\mu$ diam...6. *G. palea aeruginosa.*
4. Cells less than 2 $\mu$ diam.....5.
4. Cells 2 $\mu$ or more diam.....7.
5. Tegument of individual cells dark violet, colonial tegument hyaline. 2. *G. endochromatica.*
5. Tegument homogeneous and hyaline throughout.....6.
6. Cells 0.8–1 $\mu \times 2$–3 $\mu$; two to four cells in a colony.....1. *G. prototypa.*
6. Cells 1.2–1.5 $\mu \times 3$–4 $\mu$; up to 32 cells in a colony.....3. *G. parvula.*
7. Cells 3 $\mu$ or more in diam.....8.
7. Cells 2–2.5 $\mu \times 3$–4.5 $\mu$, two to four in a colony; tegument opalescent. 4. *G. opalothecata.*
8. Tegument mucous, hyaline, cells 3–4 $\mu \times 6$–12 $\mu$, few in a colony. 5. *G. palea.*
8. Tegument dark yellow; cells 4–4.5 $\mu \times 9$–15 $\mu$; 16–32 in a colony.....8. *G. rupestris.*

1. **Gloeothece prototypa** Gardner, Mem. N. Y. Bot. Gard. **7**: 14, *pl. 3, f. 32.* 1927.

On a water pipe near a stream, Maricao, *1147a;* on limestone between Hatillo and Arecibo, *1377a, 1378a;* on limestone at Hato Arriba, Arecibo, *1407b;* on limestone between Arecibo and Utuado, *1481a.* Type locality, near Arecibo.

2. **Gloeothece endochromatica** Gardner, N. Y. Bot. Gard. **7**: 13, *pl. 3, f. 29.* 1927.

On limestone between Arecibo and Utuado, *1465a.* Type locality, near Arecibo.

3. **Gloeothece parvula** Gardner, Mem. N. Y. Bot. Gard. **7**: 14, *pl. 3, f. 30.* 1927.

In depressions in the limestone near Hato Arriba, Arecibo, *1410b.* Type locality, near Arecibo.

4. **Gloethece opalothecata** Gardner, Mem. N. Y. Bot. Gard. **7**: 14, *pl. 3, f. 31.* 1927.

On limestone near Hato Arriba, Arecibo, *1434.* Type locality, near Arecibo.

5. **Gloeothece palea** (Kuetz.) De Toni, Syll. Alg. **5**: 62. 1907.

*Gloeocapsa palea* Kuetz. Tab. Phyc. **1**: *pl. 20, f. 7.* 1845.

On the walls of a bridge, Juan Martin, Fajardo, *713a;* in depressions in the limestone, Hato Arriba, Arecibo, *1410a;* on shaded rocks about seven kilometers east of Coamo, *1873.*

6. **Gloeothece palea aeruginosa** (Kuetz.) Hansg. Prod. **2**: 135. 1893.

*Gloeocapsa gelatinosa aeruginosa* Kuetz. Tab. Phyc. **1**: *pl. 20, f. VI,* b. 1845.

On rocks between Utuado and Adjuntas, *1650b.*

7. **Gloeothece interspersa** Gardner, Mem. N. Y. Bot. Gard. **7**: 13, *pl. 3, f. 28.* 1927.

On a wall by the Hotel Nava, Santurce, *54a.* Type locality, Santurce.

8. **Gloeothece rupestris** (Lyngb.) Born.; Wittr. & Nord. Exsicc. no. 399. 1880.

*Palmella rupestris* Lyngb. Hydroph. Dan. 207. *pl. 69, f. D.*

On limestone at the Hacienda, Laguna Tortuguero, *866a;* on a brick wall, Experiment Station, Mayaguez, *967;* on limestone by the road between Arecibo and Utuado, *1469b, 1470;* on damp rocks about ten kilometers north of Utuado, *1528a;* on rocks between Utuado and Adjuntas, *1637a, 1650a;* on rocks near Arroyo de los Corchos, *1697.* Type locality, Norway.

9. **Gloeothece fuscolutea** Naeg. Gatt. Einz. Alg. 58. 1849.

On rocks near a stream, Maricao, *1129;* on rocks about ten kilometers north of Utuado, *1566, 1568a;* on the walls of Fort San Cristobal, San Juan, *1998c, 2003c.* Type locality, Zürich.

### 12. **ENTOPHYSALIS** Kuetz. Phyc. Gen. 177. 1843.

Type species, *Entophysalis granulosa.*

1. Cells 2–2.5 μ diam., greenish aeruginous, forming a continuous stratum 50–100 μ thick.....1. *E. chlorophora.*
1. Cells 1.5–2.5 μ diam., aeruginous, forming microscopic cushions 60–100 μ thick; tegument opalescent to violet.....2. *E. Willei.*

1. **Entophysalis Willei** *nom. nov.*

*Entophysalis violacea* Gardner, Mem. N. Y. Bot. Gard. **7:** 30, *pl. 6, f. 56.* 1927. Not *E. violacea* Collins; *in* Britton & Millspaugh, Bahama Flora, 619. 1920.

On rocks at Hato Arriba, Arecibo, *1433.* Type locality, Arecibo.

2. **Entophysalis chlorophora** Gardner, Mem. N. Y. Bot. Gard. **7:** 30, *pl. 6, f. 55.* 1927.

On pebbles in a stream of warm water by the Hot Spring, Coamo Springs, *381.* Type locality, Coamo Springs.

### 13. **PLACOMA** Schousb.; Born. et Thur. Not. Algol. **1:** 4. 1876.

Type species, *Placoma vesiculosa.*

1. **Placoma Willei** Gardner, Mem. N. Y. Bot. Gard. **7:** 29, *pl. 6, f. 54.* 1927.

On rocks near Laguna Joyuda, Mayaguez, *1209;* near Maricao, *1290c;* on bark at Utuado, *1506c.* Type locality, Maricao.

### 14. **ANACYSTIS** Menegh. Consp. Alg. Eug. 6. 1837.

Type species *Anacystis marginata.*

1. Tegument hyaline or opalescent.....2.
1. Tegument variously colored.....12.
2. Resting spores rough or unknown.....3.
2. Resting spores smooth.....5.
3. Resting spores tuberculate.....9. *A. amplivesiculata.*
3. Resting spores spinose.....4.
3. Resting spores unknown.....17.
4. Spore wall beset with blunt spines.....1. *A. gigas.*
4. Spore wall beset with densely crowded, sharp spines....7. *A. magnifica.*
5. Color of spore wall hyaline.....7.
5. Color of spore wall not hyaline.....6.
6. Color of spore wall purple.....2. *A. nigropurpurea.*
6. Color of spore wall coral red.....13. *A. Willei.*
7. Color of colonial tegument opalescent.....4. *A. cylindracea.*
7. Color of colonial tegument hyaline.....8.
8. Size of colonies 50 μ or more diam.....10.
8. Size of colonies 50 μ or less diam.....9.

9. Cells 0.8–1.2 $\mu$ diam.....15. *A. minutissima.*
9. Cells 2.8–3.4 $\mu$ diam.....16. *A. consociata.*
10. Colonies very irregular in form.....14. *A. irregularis.*
10. Colonies spherical to subspherical.....11.
11. Cells radially arranged in the colonies; spores 5–6 $\mu$ diam.....17. *A. radiata.*
11. Cells radially arranged in the colonies; spores 10–11 $\mu$ diam.
18. *A. radiata major.*
12. Spore wall hyaline.....5. *A. compacta*
12. Spore wall colored.....13.
13. Tegument coral-red or pink.....15.
13. Tegument not coral-red nor pink.....14.
14. Tegument dark violet.....3. *A. nigroviolacea.*
14. Tegument early hyaline, later becoming yellow to brown.
8. *A. microsphaeria.*
15. Spore wall coral-red.....12. *A. pulchra.*
15. Spore wall hyaline.....16.
16. Colonies 15–30 $\mu$ diam.; cells 2–2.4 $\mu$ diam.....10. *A. gloeocapsoides.*
16. Colonies 25–40 $\mu$ diam.; cells 3.5–4.5 $\mu$ diam.....11. *A. nidulans.*
17. Colonies 20–25 $\mu$ diam., spherical, containing up to 64 cells....6. *A. distans.*
17. Colonies irregular in shape and size, containing up to 1000 cells.
19. *A. anomala.*

1. **Anacystis gigas** (W. and G. S. West) Gardner, Mem. N. Y. Bot. Gard. **7:** 15. 1927.

*Gloeocapsa gigas* W. and G. S. West, Jour. Linn. Soc. Bot. **30:** 276, *pl. 16, f. 11–13.* 1895.

In depressions in limestone rock between Hatillo and Arecibo, *1387b;* on old wood at Hato Arriba, Arecibo, *1397b;* on limestone between Arecibo and Utuado, *1476;* on a wall in Fort San Cristobal, San Juan, *1991c, 1993, 2002, 2003d, 2008, 2014c, 2021.* Type locality, Sharp's River, St. Vincent Island.

2. **Anacystis nigropurpurea** Gardner, Mem. N. Y. Bot. Gard. **7:** 18, *pl. 3, f. 33.* 1927.

On the wall of a church, Sabana Grande, *962b;* on bark along the road to Monte Montoso, Maricao, *1087;* on a water pipe, Maricao, *1155;* in depressions in the limestone between Hatillo and Arecibo, *1387a;* on limestone, Hato Arriba, Arecibo, *1397a, 1399c.* Type locality, near Arecibo.

3. **Anacystis nigroviolacea** Gardner, Mem. N. Y. Bot. Gard. **7:** 19, *pl. 3, f. 34.* 1927.

On rocks about ten kilometers north of Utuado, *1553;* on limestone at Hato Arriba, Arecibo, *1399d;* on limestone between Arecibo and Utuado, *1476a;* on rocks in Jayuya, *1770c.* Type locality, near Utuado.

4. **Anacystis cylindracea** Gardner, Mem. N. Y. Bot. Gard. **7:** 19, *pl. 3, f. 35.* 1927.

On rocks between Utuado and Adjuntas, *1640a.* Type locality, near Utuado.

5. **Anacystis compacta** Gardner, Mem. N. Y. Bot. Gard. **7:** 20, *pl. 4, f. 36.* 1927.

On the bark of a tree trunk, Caguas, *439.* Type locality, Caguas.

6. **Anacystis distans** Gardner, Mem. N. Y. Bot. Gard. **7:** 21, *pl. 4, f. 37.* 1927.

In a ditch by a stream near Maricao, *1148b, 1155e;* on limestone between Arecibo and Utuado, *1465a.* Type locality, Maricao.

7. **Anacystis magnifica** Gardner, Mem. N. Y. Bot. Gard. **7**: 21, *pl. 4, f. 38.* 1927.

On a water pipe near a stream at Maricao, *1148c;* on a wall in Fort San Cristobal, San Juan *2016a.* Type locality, San Juan.

8. **Anacystis microsphaeria** Gardner, Mem. N. Y. Bot. Gard. **7**: 22, *pl. 4, f. 39.* 1927.

On a wall at Coamo Springs, *299a.* Type locality, Coamo Springs.

9. **Anacystis amplivesiculata** Gardner, Mem. N. Y. Bot. Gard. **7**: 22, *pl. 4, f. 40.* 1927.

On a church wall at Sabana Grande, *962c;* on bark by the road to Monte Montoso, Maricao, *1087a, 1088a.* Type locality, near Maricao.

10. **Anacystis gloeocapsoides** Gardner, Mem. N. Y. Bot. Gard. **7**: 22, *pl. 4, f. 41.* 1927.

On rocks by Laguna Joyuda, Mayaguez, *1304.* Type locality, Mayaguez.

11. **Anacystis nidulans** Gardner, Mem. N. Y. Bot. Gard. **7**: 23, *pl. 4, f. 42.* 1927.

On bark near Laguna Joyuda, Mayaguez, *1207a.* Type locality, Mayaguez.

12. **Anacystis pulchra** Gardner, Mem. N. Y. Bot. Gard, **7**: 23, *pl. 4, f. 43.* 1927.

On the soil by the road towards Monte Montoso, Maricao, *1094.* Type locality, near Maricao.

13. **Anacystis Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 24, *pl. 5, f. 44.* 1927.

On soil by the road to Monte Montoso, Maricao, *1094a;* on stones near Laguna Joyuda, Mayaguez, *1209a, 1307a;* on the rocks, Jayuya, *1770a;* on rocks in a ravine, Coamo Springs, *1901d.* Type locality, Mayaguez.

14. **Anacystis irregularis** Gardner, Mem. N. Y. Bot. Gard. **7**: 24, *pl. 5, f. 45.* 1927.

On the trunks of trees, Coamo Springs, *300;* on stone west of Humacao, *572a, 577a;* on rocks near Hacienda Catalina, Palmer, *791a;* on serpentine rock, Mayaguez, *890;* on lava rock near the road to Monte Montoso, Maricao, *1065d,* Type locality, Coamo Springs.

15. **Anacystis minutissima** Gardner, Mem. N. Y. Bot. Gard. **7**: 25, *pl. 5, f. 46.* 1927.

On tree trunks, on a wall and in the overflow from a hot spring, Coamo Springs, *300d, 402b, 367e;* on the wall of a bridge in Caguas, *462;* on a brick wall near Juan Martin, Fajardo, *732a;* in depressions in limestone between Cabo Rojo and San German, *1194a;* on shaded rocks about seven kilometers east of Coamo, *1869e.* Type locality near San German.

16. **Anacystis consociata** Gardner, Mem. N. Y. Bot. Gard. **7**: 25, *pl. 5, f. 47.* 1927.

On a wooden fence near Santurce, *2c;* on a wall, Hotel Nava, Santurce, *56j;* on a tree trunk and on rocks in a ravine, Coamo Springs, *300a, 1901c;* on a tree trunk, Fajardo, *656;* on a church wall, Sabana Grande, *961d;* on a garden wall, Hotel Paris, Mayaguez, *981b;* on the trunks of trees along the road near Monte Montoso, Maricao, *1062;* on the soil, Hacienda Holm, Mayaguez, *1176b.* Type locality, near Santurce.

17. **Anacystis radiata** Gardner, Mem. N. Y. Bot. Gard. **7**: 26, *pl. 5, f. 48.* 1927.

On a wall, Governor's Palace, San Juan, *58b;* on old wood in the primeval forest, Hacienda Catalina, Palmer, *755;* on rocks in a ravine, Coamo Springs, *1901a.* Type locality, Coamo Springs.

18. **Anacystis radiata major** Gardner, Mem. N. Y. Bot. Gard. **7**: 26, *pl. 5, f. 49.* 1927.

On shaded rock about seven kilometers east of Coamo, *1869f, 1870x;* Cayo Muertos, *Britton, Cowell, and Brown, 5082a.* Type locality, near Coamo.

19. **Anacystis anomala** Gardner, Mem. N. Y. Bot. Gard. **7**: 26, *pl. 5, f. 50.* 1927.

On a wall, San Martin, Fajardo, *732b.* Type locality, Fajardo.

### 15. **ENDOSPORA** Gardner, Mem. N. Y. Bot. Gard. **7**: 26. 1927.

Type species, *Endospora rubra.*

1. Colonies containing up to 64 cells ..... 2.
1. Colonies containing fewer cells ..... 3.
   2. Cell walls pink or coral red ..... 1. *E. rubra.*
   2. Cell walls olive to dark drab ..... 5. *E. olivacea.*
3. Colonies containing 2, rarely 4, cells, walls pink or brick red ..... 3. *E. bicocca.*
3. Colonies containing more than 4 cells ..... 4.
   4. Cell walls yellow to honey colored ..... 2. *E. mellea.*
   4. Cell walls very dark, almost black ..... 4. *E. nigra.*

1. **Endospora rubra** Gardner Mem. N. Y. Bot. Gard. **7**: 28, *pl. 5, f. 51.* 1927.

On old wood by the Hot Springs, Coamo Springs, *405;* on old logs north of Mayaguez, *1000e;* on stones near Laguna Joyuda, Mayaguez, *1209b, 1301a;* on bark and on blocks of lava near Coamo Springs, *1912a, 1916a, 1923a;* on limestone, Coamo Springs, *Britton, 9033.* Type locality, Coamo Springs.

2. **Endospora mellea** Gardner, Mem. N. Y. Bot. Gard. **7**: 28. 1927.

On rock about ten kilometers north of Utuado, *1533a;* on rocks, Jayuya, *1770d;* on limestone in Guanica, *1840a.* Type locality, near Utuado.

3. **Endospora bicocca** Gardner, Mem. N. Y. Bot. Gard. **7**: 28, *pl. 5, f. 52.* 1927.

On logs and on the soil by the road to Monte Montoso, Maricao, *1071d, 1077e.* Type locality, near Maricao.

4. **Endospora nigra** Gardner, Mem. N. Y. Bot. Gard. **7**: 29, *pl. 5, f. 53.* 1927.
On logs north of Sabana Grande, *925.* Type locality, near Sabana Grande.

5. **Endospora olivacea** Gardner, Mem. N. Y. Bot. Gard. **7**: 29. 1927.

On a wall in Caguas, *462a.* Type locality, Caguas.

### 16. **CYANOTHRIX** Gardner, Mem. N. Y. Bot. Gard. **7**: 30. 1927.
(non *Cyanothrix* Schmidle, 1897.)

Type species, *Cyanothrix primaria.*

1. Filaments 9–11 $\mu$ diam.; cells 6–6.5 $\mu$ diam ..... 2. *C. Willei.*
1. Filaments 18–22 $\mu$ diam.; cells 10–15 $\mu$ diam ..... 1. *C. primaria.*

1. **Cyanothrix primaria** Gardner, Mem. N. Y. Bot. Gard. **7**: 31, *pl. 6, f. 57.* 1927.

In Laguna Tortuguero and on the shores, *830b, 849c.* Type locality, Laguna Tortuguero.

2. **Cyanothrix Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 31, *pl. 6, f. 58.* 1927.

Among other algae in Laguna Tortuguero, *830e, 844e.* Type locality, Laguna Tortuguero.

## Order 2. CHAMAESIPHONALES

## Family 2. CHAMAESIPHONACEAE

Characters same as the order.

1. Plants usually floating free.....19. *Gomphosphaeria.*
1. Plants usually attached.....2.
2. Plants more or less filamentous.....3.
2. Plants not forming true filaments.....4.
3. Filaments more or less cylindrical, unbranched.....20. *Chamaesiphon.*
3. Filaments much branched, forming a basal disk from which arise erect simple filaments.....18. *Radaisia.*
4. Cell division and gonidia formation both present.....17. *Xenococcus.*
4. Reproduction by gonidia only.....20a. *Dermocarpa.*

17. **XENOCOCCUS** Thur. Ann. Sci. Nat. Bot. VI, **1**: 373. 1875 (*nomen nudum*); Born. et Thur. Not. Alg. **2**: 73, 1880 (description of type, *X. Schousboei*).

1. **Xenococcus Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 33, *pl. 7, f. 60.* 1927.

In a stream about five kilometers east of Coamo, *221e;* on twigs in a stream near Maricao, *1260.* Type locality, near Coamo.

18. **RADAISIA** Sauv. Jour. de Bot. **9**: 373. 1895.

Type species, *Radaisia Gomontiana.*

1. Thallus less than 20 $\mu$ thick.....1. *R. epiphytica.*
1. Thallus more than 20 $\mu$ thick.....2.
2. Thallus 30–40 $\mu$ thick; cells in the erect filaments much shorter than wide.....2. *R. Willei.*
2. Thallus 40–50 $\mu$. thick; cells in the erect filaments nearly isodiametric.....3. *R. confluens.*

1. **Radaisia epiphytica** Gardner, comb. nov.

*Pleurocapsa epiphytica* Gardner, Mem. N. Y. Bot. Gard. **7**: 31, *pl. 6, f. 59.* 1927.

In a pool about four kilometers north of Mayaguez, *1323b.* Type locality, near Mayaguez.

2. **Radaisia Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 32. 1927.

On stones in a brook west of Humacao, *593.* Type locality, near Humacao.

3. **Radaisia confluens** Gardner, Mem. N. Y. Bot. Gard. **7**: 32. 1927.

In a brook near San Lorenzo, *498;* on stones in the Rio Grande, near Sabana Grande, *915,* in a spring in the woods near Maricao, *1076;* in a stream near the "Campo," Maricao, *1233.* Type locality, near Maricao.

19. **GOMPHOSPHAERIA** Kuetz. Alg. Dec. XVI, no. 151.

Type species, *Gomphosphaeria aponina.*

1. **Gomphosphaeria aponina** Kuetz. Tab. Phyc. **1**: *pl. 31, f. III,* 1847.

In Laguna Tortuguero, *831.* Type locality, Abano.

20. **CHAMAESIPHON** A. Braun et Grunow; Rabenhorst, Fl. Eur. Alg. **2**: 148. 1865.

Type species, *Chamaesiphon confervicola*.

1. Filaments cylindrical, 6–8 μ long, 2.3–2.5 μ diam.....1. *C. portoricensis*.
1. Filaments cylindrical, somewhat curved, 50–70 μ long, 5.8–7.2 μ diam.....2. *C. Willei*.

1. **Chamaesiphon portoricensis** Gardner, Mem. N. Y. Bot. Gard. **7**: 33, *pl. 7, f. 61*. 1927.

In a ditch by the Hot Springs, Coamo Springs, *396;* in a pool about four kilometers north of Mayaguez, *1323x*. Type locality, Coamo Springs.

2. **Chamaesiphon Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 34, *pl. 7, f. 62*. 1927.

In a water reservoir, Rio Piedras, *105a, 119b*. Type locality, Rio Piedras.

20a. **DERMOCARPA** Crouan, Ann. Sci. Nat. Bot. IV, **9**: 70. 1858.

Type species *D. violacea*.

1. **Dermocarpa prasina** (Reinsch) Born. & Thur. Notes Alg. 75, *pl. 26, f. 6–9*. 1880.

Lt. Princess, St. Croix, *Boergesen. 15x*. The material is immature. Type locality, Europe.

## Order 3. HORMOGONALES

1. Cells practically uniform in character, not differentiated. Suborder 1. Homocystineae.
1. Cells differentiated, some modified into heterocysts and others into hair cells.....Suborder 2. Heterocystineae.

## Suborder 1. HOMOCYSTINEAE

### Family 3. OSCILLATORIACEAE

1. Trichomes destitute of a sheath.....2.
1. Trichomes provided with a sheath.....3.
2. Trichomes straight, arcuate, or irregularly twisted...1. Oscillatorieae.
2. Trichomes twisted into a regular spiral.....2. Spirulineae.
3. Trichomes single within the sheath.....3. Lyngbyeae.
3. Trichomes two to many rarely single within a common sheath. 4. Schizotricheae.

#### Subfamily 1. OSCILLATORIEAE

21. **OSCILLATORIA** Gom. Jour. de Bot. **5**: 273. 1891. *Oscillatoria* Vauch. Hist. Conferv. 165. 1803 (*lim. mut.*)

Type species, *Oscillatoria princeps* Vauch.

1. Plants marine.....33.
1. Plants fresh water.....2.
2. Trichomes 10 μ or more diam.; cells relatively very short.....3.
2. Trichomes 10 μ or less diam.; cells usually longer.....11.
3. Trichomes up to 60 μ diam.....4.
3. Trichomes not over 25 μ diam.....5.
4. Trichomes slightly attenuated and uncinate, subcapitate, aeruginous.....1. *O. princeps*.
4. Trichomes slightly attenuated and uncinate, subcapitate, purple.....2. *O. princeps purpurea*.
5. Trichomes decidedly uncinate, capitate.....6. *O. proboscidea*.

5. Trichomes straight....6.
6. Trichomes torulose....7.
6. Trichomes non torulose....9.
7. Trichomes bright olive green, 7–11 μ diam., attenuated and capitate. 8. *O. nigroviridis.*
7. Trichomes aeruginous or brownish....8.
8. Trichomes straight, slightly attenuated, capitate, 10–14 μ diam....4. *O. sancta caldariorum.*
8. Trichomes straight, slightly attenuated, capitate, 15–20 μ diam....5. *O. sancta aequinoctialis.*
9. Trichomes with numerous refringent cells, 9–10 μ diam....9. *O. refringens.*
9. Trichomes without refringent cells....10.
10. Trichomes 11–20 μ diam., not attenuated nor capitate....5. *O. limosa.*
10. Trichomes 23–25 μ diam., end wall slightly thickened....7. *O. obtusa.*
11. Trichomes more or less definitely attenuated....12.
11. Trichomes not attenuated....21.
12. Trichomes capitate....24. *O. amoena*
12. Trichomes non capitate....13.
13. Cells quadrate or shorter than the diameter....15.
13. Cells quadrate or longer than the diameter....14.
14. Trichomes 2.2–2.4 μ diam., with acuminate and uncinate apices; cells 4–5 μ long....32. *O. Earlei.*
14. Trichomes 2.3–2.5 μ diam., mostly with acute and straight apices; cells up to 11 μ long....33. *O. claricentrosa.*
14. Trichomes 3–5 μ diam., with decidedly acuminate and uncinate apices, cells 5.5–8 μ long....27. *O. acuminata.*
15. Cell contents yellowish green; cells 3–5 μ diam....26. *O. laetevirens.*
15. Cell contents aeruginous....16.
16. Trichomes 4 μ or less diam....17.
16. Trichomes 4 μ or more diam....18.
17. Trichomes 2.5 μ diam., much contorted....25. *O. tortuosa.*
17. Trichomes 3–4 μ diam., straight or arcuate....28. *O. animalis.*
18. Trichomes 6 μ or more diam.; cells quadrate, apices blunt....19.
18. Trichomes 6 μ or less....20.
19. Trichomes 6.4–7.2 μ diam....31. *O. chalybea insularis.*
19. Trichomes 8–13 μ diam....31a. *O. chalybea genuina.*
20. Trichomes not constricted, with refringent cells....29. *O. brevis.*
20. Trichomes constricted, refringent cells absent....30. *O. formosa.*
21. Trichomes constricted at the cross walls....22.
21. Trichomes not constricted at the cross walls....23.
22. Trichomes 2.3–4 μ diam., much constricted....16. *O. geminata.*
22. Trichomes 4–6 μ diam., slightly constricted....12. *O. tenuis natans.*
22. Trichomes 6–10 μ diam., slightly constricted....13. *O. tenuis tergestina.*
23. Cell contents aeruginous....27.
23. Cell contents not aeruginous....24.
24. Cell contents purplish blue, cells 6–11 μ diam....10. *O. irrigua.*
24. Cell contents not purplish....25.
25. Trichomes 8–9 μ diam.; cell contents yellowish green....11. *O. simplicissima.*
25. Trichomes less than 8 μ diam....26.
26. Apical cell blunt; cells 3.5–4 μ diam., 3.7–8 μ long....17. *O. chlorina.*
26. Apical cell conical; cells 3.4–3.6 μ diam., quadrate or less. 18. *O. chlorina conica.*
27. Trichomes not constricted, 6.8–7.8 μ diam....14. *O. tenuis levis.*
27. Trichomes less than 6 μ diam....28.
28. Trichomes 0.6 μ diam., cell walls indistinct....19. *O. angustissima.*
28. Trichomes 2 μ or more diam....29.
29. Granules collected at the cross walls....30.
29. Granules not collected at the cross walls....31.
30. Usually a pair of granules at the cross wall....15. *O. amphibia.*
30. Granules numerous at the cross wall....23. *O. granulata.*
31. Cell walls very conspicuous and thick....32.

31. Cell walls thin; trichomes 2.4–2.6 μ diam.....22. *O. Willei.*
32. Trichomes straight or arcuate, 2.8–3.2 μ diam.....20. *O. articulata.*
32. Trichomes circinate.....21. *O. articulata circinata.*
33. Trichomes torulose.....34.
33. Trichomes non-torulose.....36.
34. Trichomes less then 5 μ diam.....34. *O. salinarum.*
34. Trichomes over 5 μ diam.....35.
35. Trichomes 6–10 μ diam.....35. *O. Corallinae.*
35. Trichomes 17–29 μ diam.....36. *O. margaritifera.*
35. Trichomes 18–36 μ diam.....39. *O. Bonnemaisonii.*
36. Trichomes capitate, 5.8–6.4 μ diam.....37. *O. maricola.*
36. Trichomes not capitate, 12–13 μ diam.....38. *O. additicia.*

1. **Oscillatoria princeps** Vauch. Hist. Conferv. 190. *pl. 15, f. 2.* 1803.

In a brook near Rio Piedras, *82;* in a stream about five kilometers east of Coamo, *227;* in the Coamo River near Coamo Springs, *356;* in the mud, Turabo River, Caguas, *486;* in the mud by a stream, Fajardo, *676;* in a ditch on the way to the "Playa," Fajardo, *696;* in Laguna Tortuguero, *831c;* in a pool of water, four kilometers from Mayaguez, *1311;* on *Nitella* in a drain at Ponce, *1814;* on old wood and bark by Laguna Joyuda, Mayaguez, *1299;* on limestone, Arecibo, *1373.* Type locality, Creven, near Geneva, Switzerland.

2. **Oscillatoria princeps** forma **purpurea** Collins, Proc. Amer. Acad. Arts and Sci. **37:** 239. 1901.

Collected by *Dr. W. C. Earle* in Porto Rico, locality not designated. Type locality, Jamaica.

3. **Oscillatoria sancta aequinoctialis** Gom. Ann. Sci. Nat. Bot. VII, **16:** 210. 1892.

On an old cemetery wall, San Juan, *130c;* on earth at Humacao, *622;* on the way to the "Playa," Fajardo, *701,* on moist rocks and in ditches by the road side twelve kilometers north of Utuado, *1514b, 1519, 1520;* in ditches near Ponce, *1670;* in a pool at Laguna Guanica, *1818.*

4. **Oscillatoria sancta caldariorum** Lagerh. Bot. Notis. 49. 1886.

Collected by *Dr. W. C. Earle* in Porto Rico, locality not designated. Type locality, Stockholm.

5. **Oscillatoria limosa** (Roth) Ag. Disp. Alg. Suec. 35. 1912.

*Conferva limosa* Roth, Cat. Bot. **3:** 197. 1806.

Among water plants in Turabo River, Caguas, *487a;* in Laguna Tortuguero, *822.* Type locality, Sweden.

6. **Oscillatoria proboscidea** Gom. Ann. Sci. Nat. Bot. VII, **16:** 209, *pl. 6, f. 10, 11.* 1892.

In a stream at Rio Piedras, *82b.* Type locality, in the vicinity of the Cameroon Mountains, Africa.

7. **Oscillatoria obtusa** Gardner, Mem. N. Y. Bot. Gard. **7:** 38, *pl. 8, f. 73.* 1927.

In slime by the Turabo River, Caguas, *486c;* in a ditch by the road to the Playa, Fajardo, *696e;* in a pool at Borinquen Park, Santurce, *807.* Type locality, Santurce.

8. **Oscillatoria nigroviridis** Thwaites; Harvey, Phyc. Brit. *pl. 251A.* 1849.

In a ditch near the road to the Playa, Fajardo, *696a.* Type locality, Shirehampton near Bristol.

9. **Oscillatoria refringens** Gardner, Mem. N. Y. Bot. Gard. **7:** 38, *pl. 8, f. 74.* 1927.

Among water plants and in slime along the Turabo River, Caguas, *478, 486b;* upon water plants, Jayuda, *1756.* Type locality, Caguas.

10. **Oscillatoria irrigua** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 218, *pl. 6, f. 22, 23.* 1892.

*Oscillaria irrigua* Kuetz. Phyc. Gen. 189. 1843.

In a pool near the Park, Santurce, *44a, 47, 51a;* in the Turabo River, Caguas, *482.* Type locality, Berne, Switzerland.

11. **Oscillatoria simplicissima** Gom. Ann. Sci. Nat. Bot. VII, **16:** 219, *pl. 7, f. 1.* 1892.

In a stream at Fajardo, *671,* in a pool at Laguna Guanica, *1821b.* Type locality, near Salzburg, Austria.

12. **Oscillatoria tenuis natans** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 221, *pl. 7.* 1892.

*Oscillatoria natans* Kuetz. Alg. Dec. IV, no. 34.

In a brook near Rio Piedras, *82;* in a reservoir near the Experiment Station, Rio Piedras, *192;* in a pool at Borinquen Park, Santurce, *808;* in a pool between Hatillo and Arecibo, *1347a;* in a pool at Laguna Guanica, *1817b.* Type locality, "bei Weissenfels," Germany.

13. **Oscillatoria tenuis tergestina** (Kuetz.) Rab. Fl. Eur. Alg. **2:** 102. 1865.

*Oscillatoria tergestina* Kuetz. Alg. Dec. XIII, no. 123.

In a water reservoir west of the Experiment Station, Rio Piedras, *188, 1924, 1937, 1938, 1944, 1948, 1950;* on rocks on the road north of Maricao, *1264.* Type locality, Trieste.

14 **Oscillatoria tenuis levis** Gardner, Mem. N. Y. Bot. Gard. **7:** 35, *pl. 7, f. 66.* 1927.

Among other algae in the Turabo River near Caguas, *486a;* in a ditch along the road to the Playa, Fajardo, *696b.* In a reservoir west of the Experiment Station, Rio Piedras, *1960.* Type locality, near Caguas.

15. **Oscillatoria amphibia** Ag. Flora **10:** 632. 1827.

In a pool near the Park, Santurce, *51e.* Type locality, Carlsbad.

16. **Oscillatoria geminata** (Menegh.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 222, *pl. 7, f. 6.* 1892.

*Oscillaria geminata* Menegh. Conspectus Alg. Eug. 9. 1837.

Among water plants in a reservoir west of the Experiment Station, Rio Piedras, *154b.* Type locality, Abano, Italy.

17. **Oscillatoria chlorina** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 223. 1892.

*Oscillaria chlorina* Kuetz. Phyc. Gen. 185. 1843.

In slime by the Turabo River, Caguas, *486a;* in a stream near Maricao, *1126.* Type locality, "Bennstäd im Halle'schen."

18. **Oscillatoria chlorina conica** Gardner, Mem. N. Y. Bot. Gard. **7:** 36, *pl. 7, 69.* 1927.

Near Manati, Porto Rico, collected by *Dr. W. C. Earle.*

19. **Oscillatoria angustissima** W. and G. S. West, Jour. Bot. **35**: 300. 1897.

On the ground by a warm stream from the Hot Springs, Coamo Springs, *385b*. Type locality, Pedro, Africa.

20. **Oscillatoria articulata** Gardner, Mem. N. Y. Bot. Gard. **7**: 34, *pl. 7, f. 64*. 1927.

In a pool about four kilometers north of Mayaguez, *1312a, 1315, 1327b, 1329*; on damp rocks about twelve kilometers north of Utuado, *1514b;* in a pool near Laguna Guanica, *1822*. Type locality, near Laguna Guanica.

21. **Oscillatoria articulata circinata** Gardner, Mem. N. Y. Bot. Gard. **7**: 35, *pl. 7, f. 65*. 1927.

In a pool about four kilometers north of Mayaguez, *1329y*. Type locality, near Mayaguez.

22. **Oscillatoria Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 36, *pl. 7, f. 67*. 1927.

Among water plants in a reservoir west of the Experiment Station, Rio Piedras, *169, 192a;* in a waterfall in a stream of warm water, Coamo Springs, *369;* in a warm water rivulet, Coamo Springs, *391a*. Type locality, near Rio Piedras.

23. **Oscillatoria granulata** Gardner, Mem. N. Y. Bot. Gard. **7**: 37, *pl. 8, f. 71*. 1927.

In a pool at the Park, Santurce, *51b*. Type locality, Santurce.

24. **Oscillatoria amoena** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16**: 225, *pl. 7, f. 9*. 1892.

In Laguna Tortuguero, *830d*. Type locality, Italy.

25. **Oscillatoria tortuosa** Gardner, Mem. N. Y. Bot. Gard. **7**: 34, *pl. 7, f. 63*. 1927.

On a water pipe near a stream, Maricao, *1147a*. Type locality, Maricao.

26. **Oscillatoria laete-virens** (Crouan) Gom. Ann. Sci. Nat. Bot. VII, **16**: 226, *pl. 7, f. 11*. 1892.

*Oscillatoria laete-virens* Crouan, Bull. Soc. Bot. France, **7**: 371. 1860 (*nomen nudum*).

On the ground by a warm stream from the Hot Spring, Coamo Springs, *385a*. Type locality, "Penfeld," Finistère, France.

27. **Oscillatoria acuminata** Gom. Ann. Sci. Nat. Bot. VII. **16**: 227, *pl. 7, f. 12*. 1892.

On a wall in an old cemetery, San Juan, *130f;* in a pool, Laguna Grande, *1821c;* in a salt water ditch, Salinas Bay, near Guanica, *Howe, 2669c*. Type locality, Italy.

28. **Oscillatoria animalis** Ag. Flora, **10**: 632. 1827.

In a stream about five kilometers east of Coamo, *235c*. Type locality, Carlsbad.

29. **Oscillatoria brevis** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16**: 229, *pl. 7, f. 14, 15*. 1892.

*Oscillaria brevis* Kuetz. Phyc. Gen. 186. 1843.

On moist rocks about ten kilometers north of Utuado, *1526a;* on roots of *Rhizophora*, at Santurce, San Juan, *Howe, 1864*. Type locality, "Halle."

30. **Oscillatoria formosa** Bory, Dict. **12:** 474. 1827.

On mud, Mayaguez, *894a*. Type locality, Liège.

31. **Oscillatoria chalybea insularis** Gardner, Mem. N. Y. Bot. Gard. **7:** 36, *pl. 7, f. 68*. 1927.

In the vicinity of Manati, Porto Rico, collected by *Dr. W. C. Earle*. Type locality, near Manati.

31a. **Oscillatoria chalybea genuina** Gom. Ann. Sci. Nat. Bot. VII, **16:** 233. 1892.

North slope of Luquillo Mts., *Heller, 811*. Type locality, southern Germany, near Jever.

32. **Oscillatoria Earlei** Gardner, Mem. N. Y. Bot. Gard. **7:** 36, *pl. 8, f. 70*. 1927.

In the vicinity of Manati, Porto Rico, collected by *Dr. W. C. Earle*. Type locality, near Manati.

33. **Oscillatoria claricentrosa** Gardner, Mem. N. Y. Bot. Gard. **7:** 37, *pl. 8, f. 72*. 1927.

In a ditch by the road to the Playa, Fajardo, *697*. Type locality, Fajardo.

34. **Oscillatoria salinarum** Collins, *in* Collins, Holden, & Setchell, Phyc. Bor. Amer. (Exsicc.), no. 1160.

Growing in salt water, Salinas Bay, near Guanica, the type locality, *Howe, 2669*.

35. **Oscillatoria Corallinae** (Kuetz.) Gom. Jour. de Bot. **4:** 356. 1890. (pro parte).

*Leibleinia Corallinae* Kuetzing, Sp. Alg. 276. 1849.

At Catano, San Juan Harbor, *Howe 2262;* mouth of Guanica Harbor, *Howe, 6992a*. Type locality on the coast of northern France.

36. **Oscillatoria margaritifera** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 216. 1892.

*Oscillaria margaritifera* Kuetz. Tab. Phyc. **1:** 33, *pl. 43, f. X*. 1847.

At the mouth of Guanica Harbor, *Howe, 6992*. Type locality, Calvados.

37. **Oscillatoria maricola** sp. nov. Plate 1, fig. 3.

Filaments forming dense lubricous masses, more or less tortuous at the base, very straight in the upper parts on the margin of the mass, not constricted, not attenuated at the apices or only the apical cell in some cases a little narrower; cells 5.8–6.4 $\mu$ diam., quadrate to slightly longer than broad, contents pale aeruginous, homogeneous, cell walls thin but conspicuous, apical cell wall decidedly thickened. Growing in the lower littoral and upper sublittoral belts. On rocks.

Muertos Island (Caja de Muertos), *Howe, 7479;* on stones east of the mouth of Guanica Harbor, *Howe, 7311;* dredged in 15 meters of water off the mouth of Guanica Harbor, *Howe, 7446;* near low water mark, Culebra Island, *Howe 4366*, Mar. 7, 1906. All collections except *4366* made in July, 1915. Number *7479* represents the type.

In structure, this species resembles very closely *O. irrigua* Kuetz., a fresh water species from Switzerland. It differs from that species in habit and in habitat, in color, and in the length and breadth of cells.

38. **Oscillatoria additicia** sp. nov. Plate 1, fig. 2.

Trichomes relatively short, straight, and comparatively rigid, 12–13 $\mu$ diam., not constricted; cells pale aeruginous, contents homogeneous, one half to one

third as long as broad, 1–3 apical cells slightly narrowed, apical wall decidedly thickened.

Growing in small masses attached to *Amphiroa Tribulus*, in the littoral belt, Salinas Cove, near Guanica Harbor, June 27, 1915, *Howe, 7209*. Type and only known collection.

The material upon which this species is based is very sparse and is mostly in the hormogonial stage. There are, however, a few typical apices. The trichomes resemble very much those of *Hydrocoleum lyngbyaceum* but there is no sign of any sheath having been present and the apices are not quite typical. A study of more and better material will be required definitely to establish the validity of the species.

39. **Oscillatoria Bonnemaisonii** Crouan; Desmaziéres, Pl. Crypt. de France, 2 Sér., no. 537. 1858.

Krause's Lagoon, St. Croix Island, *Boergesen, 1485*. Type locality, coast of France.

Subfamily 2. **SPIRULINEAE.**

1. Dissepiments distinct, spiral always loose, filaments of relatively large size.....22. *Arthrospira.*
1. Dissepiments very obscure, spiral loose or tight, filaments relatively small.....22a. *Spirulina.*

As I pointed out in 1917 (Univ. California Publ. Bot. **6**: 377), there is no fundamental difference between these two genera. Setchell and Gardner (Univ. California Publ. Bot. **8**: 53–57. 1919) retained both genera for historical reasons and as a matter of convenience, rather than because of morphological differences. They are treated likewise here. They might be treated as sections of *Spirulina*, the older name, but that again would be merely a matter of convenience. There is no objection to calling them all *Spirulina*.

22. **ARTHROSPIRA** Stizenberger, Hedwigia **1**: 32. 1852.

Type species, *Arthrospira Jenneri*.

**Arthrospira laxissima** Setchell, Dept. Mar. Biol. Carnegie Inst. Wash. **20**: 183. 1924.

West of the mouth of Guanica Harbor, *Howe, 7280*. Type locality on the reef at Laulii, Tutuila.

This species of Myxophyceae is certainly a "borderline" species, connecting the genera *Arthrospira* and *Oscillatoria*. Its relatively large size in both length and breadth is more characteristic of *Oscillatoria* than of *Arthrospira*. The looseness of the spiral is near the limit for that character. Both the type material and this have the character of doubling back and the two ends entwining around each other, forming a very regular double spiral in many of the individuals. The species is closely related to *Arthrospira breviarticulata* Setchell & Gardner. Many of the apices are decidedly attenuated for 2–4 cells.

22a. **SPIRULINA** Turp. (emend. Gardner); Turp. Dict. d'Hist. Nat. de Levrault, **50**: 309. 1827. Gardner, Univ. Calif. Publ. Bot. **6**: 379. 1917.

Type species, *Spirulina oscillarioides*.

1. Trichomes regularly coiled; coils contiguous for the most part.....2.
1. Trichomes regularly coiled; coils not contiguous.....3.
2. Coil 2–2.7 $\mu$ diam.; trichome 1 $\mu$ diam.....1. *S. labyrinthiformis.*
2. Coil 3–5 $\mu$ diam.; trichomes 1 $\mu$ diam.; coils regular. 2. *S. subsalsa oceanica.*
2. Coil 3–5 $\mu$ diam.; trichomes 1.4–2 $\mu$ diam.; coils irregular. 4. *S. subsalsa genuina.*
3. Coil 1.2–1.6 $\mu$ diam.; trichome 0.5–0.7 $\mu$ diam.....5. *S. socialis.*
3. Coil 2.5–4 $\mu$ diam.; trichome 1.2–1.7 $\mu$ diam.....3. *S. major.*

1. **Spirulina labyrinthiformis** (Menegh.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 255. 1892.

*Oscillaria labyrinthiformis* Menegh. Consp. Alg. Eug. 9. 1837.

In a pool about four kilometers south of Mayaguez, *1329;* in a salt water ditch, Salinas Bay, near Guanica, *Howe, 2669a.* Type locality, Abano, Italy.

2. **Spirulina subsalsa oceanica** (Crouan) Gom. Ann. Sci. Nat. Bot. VII, **16:** 274. 1892.

*Oscillatoria oceanica* Crouan, Alg. Mar. Fin., no. 324 (*partim*).

On logs by the wayside, Santurce, *4.* Type locality, Brest, France.

3. **Spirulina major** Kuetz. Phyc. Gen. 183. 1843.

In a ditch on the way to the Playa, Fajardo, *696c;* in a pool about four kilometers south of Mayaguez, *1317b;* in a pool by a stream of five kilometers north of Utuado, *1586b.* Type locality, uncertain.

4. **Spirulina subsalsa genuina** Gom. Ann. Sci. Nat. Bot. VII, **16:** 254. 1892.

Culebra Island, in the lower littoral belt, *Howe, 4305a.* Type locality, coast of France.

A few filaments of this species of *Spirulina* were observed among the filaments of *Lyngbya majuscula.*

5. **Spirulina socialis** sp. nov. PLATE 1, fig. 1.

Trichomes very regularly and evenly coiled, 0.5–0.7 μ diam., forming coils 1.2–1.6 μ diam., and 1.2–1.5 μ between the coils; cell-walls inconspicuous, contents pale aeruginous.

Growing among the filaments of *Phormidium epiphyticum* Gardner, usually extending lengthwise of the filaments of the host, *Lyngbya aestuarii.*

Santurce, San Juan, May 27, 1903. *Howe 2162a,* the type and only known collection.

Morphologically, this species of *Spirulina* is very nearly like *S. subtilissima* Kuetz., the type material of which came from Abano, Italy, taken in fresh thermal water. It is smaller in all measurements and has a very distinct habit and habitat, deserving of specific rank.

Subfamily 3. **LYNGBYEAE.**

1. Filaments branched ..... 2.
1. Filaments not branched ..... 3.
2. Filaments minute, not coalescing into acute fascicles, branching freely ..... 26. *Plectonema.*
2. Filaments larger, usually coalescing into acute fascicles, branching sparse ..... 27. *Symploca.*
3. Sheath thin to thick, homogeneous or lamellose, hyaline or sometimes yellowish ..... 4.
3. Sheath thick and lamellose, reddish or purplish ..... 24. *Porphyrosiphon.*
4. Filaments always distinct; trichomes with few exceptions large and with short cells, never uncinate ..... 23. *Lyngbya.*
4. Filaments more or less confluent by their gelatinous sheaths; trichomes usually small with relatively longer cells, many attenuate, uncinate and capitate ..... 25. *Phormidium.*

23. **LYNGBYA** Ag. Syst. Alg. xxv. 1824.

Type species *Lyngbya confervoides.*

1. Species inhabiting fresh water ..... 2.
1. Species inhabiting salt or brackish water ..... 17.
2. Sheath always hyaline ..... 5.
2. Sheath hyaline in part or colored ..... 3.

3. Sheath hyaline, changing to salmon-pink ..... 11. *L. splendens.*
3. Sheath hyaline, changing to yellowish or brownish ..... 4.
4. Filaments 7–8.5 μ diam.; trichomes 5.6–7.2 μ diam. ..... 5. *L. ocreata.*
4. Filaments 16–20 μ diam.; trichomes 11–13 μ diam. 10. *L. scytonematoides.*
5. Cell contents purplish violet ..... 13. *L. magnifica.*
5. Cell contents various shades of blue-green ..... 6.
6. End wall of apical cell perceptably thickened ..... 7.
6. End wall not thickened ..... 10.
7. Trichomes 17–20 μ diam.; cell contents decidedly granular. 12. *L. intermedia.*
7. Trichomes less than 17 μ diam. ..... 8.
8. Trichomes 8–11 μ diam.; cells 2–4 μ long ..... 6. *L. nigra.*
8. Trichomes less than 8 μ diam. ..... 9.
9. Filaments 7.2–8 μ diam.; trichomes 4.8–5 μ diam. 9. *L. Martensiana minor.*
9. Filaments 4–5 μ diam.; trichomes 3–4 μ diam. ..... 4. *L. aerugineo-caerulea.*
10. Trichomes usually 20–40 μ diam.; cell contents granular, variable in color ..... 14. *L. majuscula.*
10. Trichomes less than 16 μ diam. ..... 11.
11. Granules collected at the cross walls ..... 12.
11. Granules not collected at the cross walls ..... 13.
12. Trichomes 11–13 μ diam.; cells 2.5–4 μ long ..... 7. *L. Hieronymusii.*
12. Trichomes 2 μ diam.; cells 1.2–3 μ long ..... 15. *L. Lagerheimii.*
13. Sheath thick and rough on the surface; trichomes 6–10 μ diam.; cells 1.7–3 μ long ..... 8. *L. Martensiana.*
13. Sheath thinner and smooth ..... 14.
14. Filaments epiphytic, prostrate, becoming erect at one or both ends ..... 16. *L. epiphytica aquaedulcis.*
14. Filaments epiphytic, attached by the end cell and erect ..... 15.
15. Filaments 3.5–4 μ diam.; trichomes 1.4–1.6 μ diam. ..... 3. *L. erecta.*
15. Filaments 3 μ or less diam. ..... 16.
16. Filaments 2–3 μ diam. ..... 1. *L. Kuetzingii.*
16. Filaments 1.2–1.3 μ diam. ..... 2. *L. Kuetzingii minor.*
17. Apical cell wider than the others ..... 17. *L. Baculum aeruginea.*
17. Apical cell equal to or narrower than the others ..... 18.
18. Apical cell calyptrate or capitate ..... 19.
18. Apical cell neither calyptrate nor capitate ..... 20.
19. Trichomes 2.5–4 μ diam. ..... 18. *L. lutea.*
19. Trichomes 5–12 μ diam., sheath always hyaline ..... 25. *L. semiplena.*
19. Trichomes 8–28 μ diam., sheath often colored ..... 19. *L. aestuarii* var.
20. Trichomes torulose ..... 20. *L. sordida.*
20. Trichomes non-torulose ..... 21.
21. Trichomes 16–60 μ diam., granules scattered through the protoplast ..... 22.
21. Trichomes 9–25 μ diam., granules crowded at the cross walls ..... 23.
21. Trichomes 1–1.5 μ diam., epiphytic ..... 24. *L. epiphytica.*
22. Protoplast aeruginous ..... 14. *L. majuscula.*
22. Protoplast reddish-violet colored ..... 21. *L. majuscula violacea.*
23. Protoplast aeruginous ..... 22. *L. confervoides.*
23. Protoplast violet colored ..... 23. *L. confervoides violacea.*

1. **Lyngbya Kuetzingii** (*Kuetzingi* in the original) Schmidle, Allg. Bot. Zeitsch. **3:** 58. 1897.

In a pool about four kilometers north of Mayaguez, *1323;* on roots of water plants in Arroyo de los Corchos, *1696a*. Type locality, Luganu, New Guinea.

2. **Lyngbya Kuetzingii minor** Gardner, Mem. N. Y. Bot. Gard. **7:** 39, *pl. 8, f. 76.* 1927.

In a pool about four kilometers north of Mayaguez, *1323a.* Type locality, near Mayaguez.

3. **Lyngbya erecta** Gardner, Mem. N. Y. Bot. Gard. **7:** 38, *pl. 8, f. 75.* 1927.

On stones in a brook in the vicinity of San Lorenzo, *501a.* Type locality, near San Lorenzo.

4. **Lyngbya aerugineo-caerulea** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 146, *pl. 4, f. 1–3.* 1892.

*Oscillaria aerugineo-caerulea* Kuetz. Phyc. Gen. 185. 1843.

On damp soil by a pool near the Park, Santurce, *52b;* on earth by the bridge, Caguas, *452, 455a, b, 457, 458;* in a stream west of Humacao, *579;* in a drain south of Mayaguez, *1014.* Type locality not designated in the original; from authentic material in the herbarium of Lenormand (*fide* Gomont, *loc. cit.*).

5. **Lyngbya ocreata** Gardner, Mem. N. Y. Bot. Gard. **7:** 39, *pl. 8, f. 77.* 1927.

On damp earth by the Playa, Fajardo, *710c, 711.* Type locality, Fajardo.

6. **Lyngbya nigra** Ag. Syst. Alg. 312. 1824.

On a wall in an old cemetery, San Juan, *130e;* on the earth east of Humacao, *622a.* Type locality, Sweden.

7. **Lyngbya Hieronymusii** Lemm. Forsch. Biolog. Stat. zu Plön, **12:** 146, *pl. 4, f. 12, 13.* 1895.

In a pool about four kilometers north of Mayaguez, *1312, 1316, 1317, 1324a;* in a pool between Hatillo and Arecibo, *1357;* in a pool near Laguna Guanica, *1816;* in a stream about five kilometers east of Coamo, *1871, 1885b.* Type locality, Brandenburg.

8. **Lyngbya Martensiana** Menegh. Consp. Alg. Eugan. 12. 1837. Authentic specimen in the Herbarium Thuret.

In the reservoir west of the Experiment Station, Rio Piedras, *200a, 204a;* in a stream about five kilometers east of Coamo, *243;* in a pool about four kilometers north of Mayaguez, *1011, 1310b, 1312c, 1318b, 1324;* in a pool between Hatillo and Arecibo, *1347, 1360;* on the earth, Arroyo de los Corchos, *1691c.* Type locality, Euganean springs.

9. **Lyngbya Martensiana minor** Gardner, Mem. N. Y. Bot. Gard. **7:** 41, *pl. 8, f. 80.* 1927.

On limestone between Hatillo and Arecibo, *1392b.* Type locality, near Hatillo.

10. **Lyngbya scytonematoides** Gardner, Mem. N. Y. Bot. Gard. **7:** 39, *pl. 8, f. 78.* 1927.

On damp earth by the Playa, Fajardo, *710b;* Playa Sucia Bay, sandy salina, *Britton, Cowell and Brown, 4789.* Type locality, Fajardo.

11. **Lyngbya splendens** Gardner, Mem. N. Y. Bot. Gard. **7:** 40, *pl. 9, f. 81.* 1927.

On the trunks of trees by the road towards Monte Montoso, Maricao, *1072.* Type locality, Maricao.

12. **Lyngbya intermedia** Gardner, Mem. N. Y. Bot. Gard. **7:** 41, *pl. 9, f. 82.* 1927.

In a pool about four kilometers north of Mayaguez, *1316b;* in a stream about five kilometers east of Coamo, *1885.* Type locality, near Mayaguez.

13. **Lyngbya magnifica** Gardner, Mem. N. Y. Bot. Gard. **7:** 40, *pl. 8, f. 79.* 1927.

In a water reservoir, Rio Piedras, *105.* Type locality, Rio Piedras.

14. **Lyngbya majuscula** (Dillw.) Harv.; *in* Hooker, Eng. Fl. **5:** part 1, 370. 1833.

*Conferva majuscula* Dillw. Brit. Conferv. Suppl. 40, *pl. A.*

FRESH WATER SPECIMENS.

In a water reservoir west of the Experiment Station, Rio Piedras, *184a, 193a;* in a stream about five kilometers east of Coamo, *221;* in the river, Caguas, *453, 477;* in a brook on the way to San Lorenzo, *494;* in a stream, Coamo. *1879;* in a stream about five kilometers from Coamo, *1885c;* in a small pool of water west of the Experiment Station, Rio Piedras, *1954.* Type locality not designated, but probably on the southern coast of England.

SALT WATER SPECIMENS.

Usually growing attached to rocks, but at times epiphytic in the lower littoral belt, Santurce, San Juan, *Howe, 1801, 1802, 1803, 1898, 1910, 1944, 2110, 2224,* and *2288;* Ponce, *Howe, 2535;* Guanica Harbor, *Howe, 2577;* Lemon Bay near Guanica, *Howe, 2626;* Culebra Island, *Howe, 4210, 4309,* and *4355;* near Tallaboa, *Howe, 4418;* Culebra Island, *Howe, 4305;* Guanica Harbor, *Howe, 6993, 6994, 6995;* Barceloneta, *M. T. Cook, 2;* near Luquillo, *P. Sintensis, 14,* collected in 1885; Princess, St. Croix Island, *Boergesen, 14, 37;* Lagoon near Christiansted, St. Croix Island, *Boergesen, 1320, 73;* Cane Bay, St. Croix Island, *Boergesen, 1414, 1416;* St. Thomas Island, *Boergesen, 1189, 2230;* St. Jan Island, *Boergesen, 1908, 1926, 2121.*

15. **Lyngbya Lagerheimii** (Moeb.) Gom. Jour. de Bot. **4:** 354. 1890.

*Spirocoleus Lagerheimii* Moebius, Hedwigia, **28:** 312, *pl. 10, f. 1, 2.* 1889.

On the wall in a tramway station, Rio Piedras, *81b;* in a pool about four kilometers north of Mayaguez, *1327e, 1329c;* on rhizomes in Laguna Guanica, *1825.* Type locality, Rio de Janeiro, Brazil.

16. **Lyngbya epiphytica aquaedulcis** Gardner, Mem. N. Y. Bot. Gard. **7:** 40, 1927.

In a brook, San Lorenzo, *494a.* Type locality, San Lorenzo.

17. **Lyngbya Baculum aeruginea** var. nov. Plate 1, fig. 5.

Trichomes pale aeruginous, not constricted, 7–8 $\mu$ diam., apical cell only slightly inflated; otherwise as the species.

In the lower littoral belt, on hydroids. Culebra Island, *Howe, 4302,* Mar. 5, 1906; on *Rhizophora* roots in the lower littoral belt, Culebra Island, *Howe 4281.* Type locality the former. The type of the species was found growing on red algae on the west coast of France.

This variety differs from the type of the species as described by Gomont in being slightly smaller, in not being constricted at the cross-walls except a few cells slightly so at the apices, in not having the apical cell so much swollen, and in not having any violet tinge to the color.

18. **Lyngbya lutea** (Ag.) Gom. Jour. de Bot. **4:** 354. 1890.

*Oscillatoria lutea* Ag. Syst. Alg. 68. 1824.
Aguadilla, *Howe, 2381a.* Type locality, Helsingburg.

Mixed with *Hydrocoleum lyngbyaceum,* in small epiphytic tufts, are numerous filaments of what seems to be the above-mentioned species of *Lyngbya.* The trichomes measure about 5 $\mu$ diam.; the cells are short; the end wall is slightly thickened; and the sheath is thin and homogeneous, in this respect not typical.

19. **Lyngbya aestuarii** var.

A considerable number of varieties of this species have been reported. The differences between the different kinds are largely based upon habit and habitat. In most cases these data are lacking in connection with the material under consideration, and in some cases the material is scanty. I am therefore merely reporting the different localities without attempting to classify the different varieties. The species seems to be abundant and widely distributed.

Santurce, *Howe, 2026 and 2162;* Culebra, *Howe, 4305;* east of the mouth of Guanica Harbor, *Howe, 7312, 7319, 7323, 7324;* Culebra Island, *Howe, 4256;* at the mouth of Guanica Harbor, *Howe, 6996;* Cayo Maria Langa, Bay of Guayanilla, *Howe, 7112, 7120, 7123;* Santurce, San Juan, *Howe, 2162;* St. Thomas, *Boergesen, 9.*

20. **Lyngbya sordida** (Zanard.) Gom. Ann. Sci. Nat. Bot. VII, **16**: 126. 1892.

*Calothrix sordida* Zanard. Saggio, 63. 1843.

Growing on *Sargassum*, dredged in 15 m. off Guanica Harbor, *Howe, 7437;* St. Croix Island, *Boergesen, 1320.* Type locality probably in the Adriatic Sea.

21. **Lyngbya majuscula violacea** var. nov. Plate 1, fig. 4.

Trichomes several cm., possibly up to 1 dm. long, 35–45 μ diam., reddish violet; sheath 5–7 μ thick; otherwise as the species.

Growing on *Rhizophora*, Guanica Harbor, *Howe, 7037*, June 23, 1915, and *7051;* Cayo Maria Langa, Bay of Guayanilla, *Howe, 7112;* on a small *Rhizophora* cay, Parguera Cove, *Howe, 7179;* Salinas Cove, near Guanica Harbor, *Howe, 7222;* dredged in 6–8 meters depth of water, Pardas Bay, *Howe 7252.* Type, *7037.*

It is not possible at present to declare positively whether the color, so pronounced in this group of plants growing in the same general region in which the species is found growing normally and in abundance, is due merely to a physiological condition and hence possibly only transitory, or whether it is a character remaining permanently under all conditions of growth. I am strongly inclined to believe that it is of no permanent diagnostic value, since it has been found to occur in species of other genera not otherwise of sufficient morphological difference to warrant separation.

22. **Lyngbya confervoides** Ag. Syst. 73. 1824.

On rocks in the littoral belt, Santurce, San Juan, *Howe, 2189;* on a drain pipe in the lower littoral belt, Guanica Harbor, *Howe, 2598;* on rocks, Culebra Island, *Howe, 4249;* on *Bostrychia, Howe, 4301*, on rocks, *4306*, on roots of *Rhizophora, Howe, 4310, 4312;* on rocks, Culebrita Island, *Howe, 4400;* on *Thalassia* near Tallaboa, *Howe, 4416.* Christiensted's Lagoon, St. Croix, *Boergesen, 1218, 1488.* Type locality, Cadiz.

23. **Lyngbya confervoides violacea** Collins, Proc. Am. Acad. **37**: 240. 1901.

On *Cladophora* sp., Aguadilla, *Howe, 2405;* Santurce, San Juan, *Howe, 2047.* Type locality, Manchioneal Bay, Jamaica.

24. **Lyngbya epiphytica** Hieronymus, *in* Kirchner, *in* Engler und Prantl, Natürl. Pflanzenfam. **1**[1a]: 67. 1898.

Epiphytic on *Lyngbya majuscula* Harv., Cane Bay, St. Croix Island. *Boergesen, 1416a.* Type locality, near Berlin.

25. **Lyngbya semiplena** J. Agardh, Alg. Med. et Adriat. 11. 1842.

Little Princess, St. Croix, *Boergesen, 14a.* Sea of Trieste.

24. **PORPHYROSIPHON** Kuetz. Tab. Phyc. **2**: 7. 1850.

Type species, *Porphyrosiphon Notarisii.*

1. Filaments 22–28 μ diam.; trichomes 18–23 μ diam.....1. *P. Notarisii major.*
1. Filaments 30–36 μ diam.; trichomes 16–20 μ diam.....2. *P. robustus.*

1. **Porphyrosiphon Notarisii major** Gardner, Mem. N. Y. Bot. Gard. 7: 41. 1927.

On the soil along the road to San Lorenzo, *523;* on the soil north of Sabana Grande, *930, 931, 935a;* on rocks near Coamo Springs, *Britton, 6008.* Type locality, near Coamo Springs.

2. **Porphyrosiphon robustus** Gardner, Mem. N. Y. Bot. Gard. **7**:41, *pl. 9, f. 83.* 1927.

On red soil at Hacienda Holm, Mayaguez, *1185a;* on rocks about four kilometers north of Utuado, *1570.* Type locality, near Utuado.

### 25. **PHORMIDIUM** Kuetz. Phyc. Gen., 190. 1843.

Type species *Phormidium inundatum.*

1. Plants growing in fresh water....2.
1. Plants marine....25.
2. Sheath hyaline at first, changing to brownish or pinkish....3.
2. Sheath always hyaline....5.
3. Trichomes 12–14 μ diam.; sheath hyaline to reddish brown....27. *P. durum.*
3. Trichomes 5 μ or less diam....4.
4. Trichomes 4.8–5.2 μ diam. interrupted in the hyaline to brownish sheath....16. *P. interruptum rigidum.*
4. Trichomes 1–1.5 μ diam.; sheath rose pink. 12. *P. scytonematicola minus.*
5. Apices of trichomes more or less uncinate....6.
5. Apices of trichomes straight....8.
6. Trichomes 5.8–6.8 μ diam., apices slightly uncinate. 24. *P. calidum olivaceum.*
6. Trichomes decidedly uncinate and capitate....7.
7. Trichomes 6–9 μ diam., with granules usually at the cross walls. 30. *P. uncinatum.*
7. Trichomes 4–7 μ diam., with granules usually at the cross walls. 28. *P. autumnale.*
7. Trichomes 3 μ diam., slightly capitate....29. *P. autumnale minus.*
8. Trichomes more or less attenuated at the apices....9.
8. Trichomes not attenuated at the apices....14.
9. Trichomes with decidedly capitate apices....10.
9. Trichomes with acute or blunt conical apices....11.
10. Trichomes 4.5–9 μ diam., with granules along the cross walls. 20. *P. favosum.*
10. Trichomes 5.5–7 μ diam., with granules scattered in the protoplast....21. *P. subfuscum Johannianum.*
11. Trichomes with acute conical apices....12.
11. Trichomes with blunt conical apices....13.
12. Trichomes moniliform, cells 1.2–2.3 μ diam., 1.2–3 μ long..1. *P. fragile.*
12. Trichomes moniliform, cells 1.5 μ diam., 0.8–2 μ long..2. *P. foveolarum.*
12. Trichomes not moniliform, cells 1–1.5 μ diam., 2–4 times as long. 7. *P. laminosum.*
13. Trichomes 3–4.5 μ diam....18. *P. Corium.*
13. Trichomes 7–10 μ diam....26. *P. Crouani.*
14. Trichomes constricted at the cross walls....15.
14. Trichomes not constricted at the cross walls....16.
15. Trichomes 1.7–2 μ diam....5. *P. luridum.*
15. Trichomes 0.6–0.8 μ diam....6. *P. angustissimum.*
15. Trichomes 5–5.4 μ diam., very slightly constricted. 25. *P. leptodermum capitatum.*
16. Trichomes various shades of blue-green....18.
16. Trichomes not blue-green....17.
17. Trichomes 1.5–2.5 μ diam., dark violet, with granules at the cross walls....3. *P. purpurascens.*

17. Trichomes 1.2–1.5 μ diam., pale purple; contents homogeneous. 4. *P. purpurascens homogeneum.*
17. Trichomes 2.2–2.4 μ diam., pale drab ..... 10. *P. rubriterricola.*
18. Trichomes 4 μ or more diam. ..... 22.
18. Trichomes less then 4 μ diam. ..... 19.
19. Granules collected at the cross walls; cells 2–2.5 μ diam. ..... 9. *P. valderianum.*
19. Protoplast more or less homogeneous ..... 20.
20. Sheath very thick, 6–7 μ; trichomes 2.5–3 μ diam. ..... 13. *P. mucosum.*
20. Sheath thin ..... 21.
21. Trichomes 1.6–1.8 μ diam.; cells 3.5–4 times as long ..... 8. *P. orientale.*
21. Trichomes 2–2.5 μ diam.; cells up to 3 times as long. 11. *P. scytonematicola.*
21. Trichomes 3–7 μ diam.; cells quadrate or less .... 15. *P. interruptum* var.
22. Apical cell rounded; end wall not thickened; trichomes 5–6.5 μ diam., interrupted in the sheath ..... 14. *P. interruptum.*
22. Apical cell truncate; end wall not thickened ..... 19. *P. Retzii.*
22. Trichome capitate, terminal wall thickened ..... 23.
23. Trichome oblique conical, capitate, trichomes 6–8 μ diam. .... 23. *P. calidum.*
23. Trichomes with blunt, rounded apices ..... 24.
24. Filaments encrusted with calcium carbonate ..... 22. *P. calcicola.*
24. Filaments not encrusted, terminal cell wall thickened, trichomes 6.5–7.5 μ diam. ..... 17. *P. interruptum capitatum.*
25. Plants epiphytic ..... 26.
25. Plants not epiphytic ..... 27.
26. Plants growing on other algae, e. g., *Lyngbya aestuarii.* 31. *P. epiphyticum.*
26. Plants growing on roots of flowering plants. 6a. *P. angustissimum saxicola.*
27. Plants forming dense cushions of considerable size ..... 33. *P. Hendersonii.*
27. Plants forming a thin stratum or free among other algae. 32. *P. tenue marinum.*

1. **Phormidium fragile** (Menegh.) Gom. Ann. Sci. Nat. Bot. VII, **16**: 163, *pl. 4, f. 13–15.* 1892.

*Anabaina fragilis* Meneghini, Consp. Alg. Eug. 8. 1837. From an authentic specimen in the Herbarium Lenormand.

In the reservoir west of the Experiment Station, Rio Piedras, *203a;* in Laguna Tortuguero, *830c.* Type locality, Euganean springs.

2. **Phormidium foveolarum** (Mont.) Gom. Ann. Sci. Nat. Bot. VII, **16**: 164. 1892.

*Leptothrix foveolarum* Montagne, Ann. Sci. Nat. Bot. III, **12**: 287. 1849.

On the road to Humacao, *542.* Type locality in France.

3. **Phormidium purpurascens** (Kuetz.) Gom. Journ. de Bot. **4**: 355. 1890.

*Leptothrix purpurascens* Kuetz. Bot. Zeit. **5**: 220. 1847.

On the rocks about ten kilometers north of Utuado, *1560.* Type locality, near Falaise in France.

4. **Phormidium purpurascens homogeneum** Gardner, Mem. N. Y. Bot. Gard. **7**: 45. 1927.

On rocks in warm water flowing from Coamo Springs, *367.* Type locality, Coamo Springs.

5. **Phormidium luridum** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16**: 165, *pl. 4, f. 17, 18.* 1892.

*Leptothrix lurida* Kuetz. Sp. Alg. 264. 1849.

In a stream of warm water, Hot Springs, Coamo Springs, *392c.* Type locality, Stuttgart, Germany.

6. **Phormidium angustissimum** W. & G. S. West, Jour. Bot. **35**: 298. 1897.

On a wall in a cemetery, San Juan, *94e;* in a reservoir west of the Experiment Station, Rio Piedras, *185, 209;* in an overflow of warm water on the rocks, Coamo Springs, *365, 366;* in a cement container at the Hot Spring, Coamo Springs, *378, 380, 382;* in warm water near the Hot Spring, Coamo Springs, *385, 390, 391, 393a;* on brackish soil near the Playa, Fajardo, *710e;* in a ditch near a stream, Maricao, *1147b;* on damp rocks about twelve kilometers north of Utuado, *1514a;* on rocks between Utuado and Adjuntas, *1637;* in a puddle near the Plaza, Ponce, *1667;* in a damp place in Jayuya, *1776;* in a pool near Laguna Guanica, *1817;* on soil on the bank of Laguna Guanica, *1829.* Type locality, Angola, Africa.

6a. **Phormidium angustissimum saxicola** var. nov. Plate 2, fig. 8.

Filaments very intricate and tortuous, with a very fragile, hyaline sheath, forming dense, thin, tough layers, light blue-green in color; trichomes 0.9–1 $\mu$ diam., slightly constricted at the conspicuous cross-walls; cells homogeneous or with 1–2 coarse granules usually at the cross-walls, about four times as long as the diam.; apices neither uncinate, attenuate, nor capitate.

Forming thin cushions on rocks in the littoral belt. Santurce, San Juan, *Howe, 1929,* the type.

Relatives of this variety of *Phormidium* seem to be *P. angustissimum* W. & G. West, a fresh water species from Africa, from which it differs in habitat, salt water, in the length and breadth characters of the cells, and in having numerous large granules, usually at the cross-walls; and *P. epiphyticum* of this paper, from which it differs slightly in size, in being constricted at the cross-walls, and in having a very different habit of growth.

7. **Phormidium laminosum** (Ag.) Gom. Jour. de Bot. **4**: 355. 1890.

*Oscillatoria laminosa* Ag. Flora, **10**: 633. 1827.

Near the Hot Spring, Coamo Springs, *382b;* in a warm water stream, *389, 392.* Type locality, Carlsbad.

8. **Phormidium orientale** G. S. West, Jour. of Bot. **40**: 248, *pl. 439, f. 25–27.* 1902.

In an overflow of warm water near the Hot Springs, Coamo Springs, *361, 362, 394.* Type locality, Sira Rimau, Malay Peninsula.

9. **Phormidium valderianum** (Delp.) Gom. Ann. Sci. Nat. Bot. VII, **16**: 167, *pl. 4, f. 20.* 1892. From authentic specimens in Herb. Montagne.

*Leptothrix Valderiæ* Delponte, Gazzetta Med. Ital., 35. 1857.

In the reservoir west of the Experiment Station, Rio Piedras, *193;* in Laguna Tortuguero, *831e.* Type locality not recorded.

10. **Phormidium rubriterricola** Gardner, Mem. N. Y. Bot. Gard. **7**: 43, *pl. 9, f. 86.* 1927.

On red earth, Maricao, *1056, 1057.* Type locality, Maricao.

11. **Phormidium scytonematicola** Gardner, Mem. N. Y. Bot. Gard. **7**: 42. 1927.

In depressions on rocks at Hacienda Catalina, Palmer, *747a;* on rocks by the road north of Maricao, *1252a;* on rocks about ten kilometers north of Utuado, *1523.* Type locality, Palmer.

12. **Phormidium scytonematicola minus** Gardner, Mem. N. Y. Bot. Gard. **7**: 42. 1927.

On rocks about ten kilometers north of Utuado, *1565a*. Type locality, near Utuado.

13. **Phormidium mucosum** Gardner, Mem. N. Y. Bot. Gard. **7:** 43, *pl. 9, f. 84*. 1927.

In a water basin in a garden in Humacao, *641*. Type locality, Humacao.

14. **Phormidium interruptum** Kuetz. Tab. Phyc. **1:** 33, *pl. 45, f. 7*. 1847.

On a wall near the reservoir, Experiment Station, Rio Piedras, *180;* on damp soil, Humacao, *548a;* on stones in the Rio Grande near Sabana Grande, *915a;* on the bark of trees in Hato Arriba, Arecibo, *1400;* on the soil, Utuado, *1505a;* on a damp wall between Utuado and Adjuntas, *1659 I and II;* on stones, Laguna Guanica, *1826*. Type locality, the southern part of the Tyrol.

15. **Phormidium interruptum** var.

On the bark of trees near the Harbor, San Juan, *59 I and II;* on the soil, Hato Arriba, Arecibo, *1411;* on the soil about five kilometers north of Adjuntas, *1665a*.

16. **Phormidium interruptum rigidum** Gardner, Mem. N. Y. Bot. Gard. **7:** 44. 1927.

On the bark of trees and on rocks, Coamo Springs, *300e, 358a;* on the wall of a church, Sabana Grande, *952*. Type locality, Coamo Springs.

17. **Phormidium interruptum capitatum** Gardner, Mem. N. Y. Bot. Gard. **7:** 44. 1927.

By the side of the road near Humacao, *540, 545, 549*. Type locality, near Humacao.

18. **Phormidium Corium** (Ag.) Gom. Jour. de Bot. **4:** 355. 1890.

*Oscillatoria Corium* Ag. Disp. Alg. Sueciae, 36. 1812.

In a waterfall in a stream of warm water, Coamo Springs, *370;* on the rocks by the road to Monte Montoso, Maricao, *1066*. Type locality, Sweden.

19. **Phormidium Retzii** (Ag.) Gom. Jour. de Bot. **4:** 355. 1890.

*Oscillatoria Retzii* Ag. Disp. Alg. Sueciae, 36. 1812.

In a reservoir west of the Experiment Station, Rio Piedras, *202a;* in the Turabo River, Caguas, *482a*.

20. **Phormidium favosum** (Bory) Gom. Ann. Sci. Nat. Bot. VII, **16:** 180, *pl. 5, f. 14, 15*. 1892.

*Oscillaria favosa* Bory, Dict. 12, 466. 1827.

On stones in the stream near "Campo," Maricao, *1231*.

21. **Phormidium subfuscum Joannianum** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **16:** 184. 1892.

*Phormidium Joannianum* Kuetz. Phyc. Gen. 193. 1843.

On the soil in Utuado, *1490*. Type locality, Florence, Italy.

22. **Phormidium calcicola** Gardner, Mem. N. Y. Bot. Gard. **7:** 44, *pl. 9, f. 87*. 1927.

In a waterfall between Arecibo and Utuado, *1460*. Type locality, near Arecibo.

23. **Phormidium calidum** (Kunth) Gom. Jour. de Bot. **4**: 355. 1890.

*Oscillatoria calida* Kunth, Synopsis, **1**: 1. 1822.

On rocks in a stream about five kilometers east of Coamo, *1875 Ib.* Type locality, "Cura," Venezuela.

24. **Phormidium calidum olivaceum** Gardner, Mem. N. Y. Bot. Gard. **7**: 42. 1927.

On shaded rocks about seven kilometers east of Coamo, *1870e.* Type locality, near Coamo.

25. **Phormidium leptodermum capitatum** Gardner, Mem. N. Y. Bot. Gard. **7**: 43, *pl. 9, f. 85.* 1927.

On rocks in a stream of warm water, Coamo Springs, *364.* Type locality, Coamo Springs.

26. **Phormidium Crouani** Gom. Ann. Sci. Nat. Bot. VII, **16**: 175, *pl. 5, f. 5.* 1892.

In the Coamo River, about five kilometers south of Coamo Springs, *328, 330;* among water plants in the Turabo River, Caguas, *487;* in a brook near San Lorenzo, *498;* in a pool, Jayuya, *1746,* forming tufts on coral in a lagoon at Santurce, San Juan, *Howe, 2051.* Type locality, Guyana.

27. **Phormidium durum** Gardner, Mem. N. Y. Bot. Gard. **7**: 45, *pl. 9, f. 88.* 1927.

On weathered rock near Humacao, *649;* on shaded rocks near the Hacienda Catalina, Palmer, *746.* Type locality, Palmer.

28. **Phormidium autumnale** (Ag.) Gom. Ann. Sci. Nat. Bot. VII, **16**: *pl. 5, f. 23, 24.* 1892.

*Oscillatoria autumnalis* Ag. Disp. Alg. Sueciae, 36. 1812.

On the wall of an old cemetery, San Juan, *130;* in the reservoir west of the Experiment Station, Rio Piedras, *183;* in a streamlet of warm water near the Hot Spring, Coamo Springs, *391a, 392a;* on a house wall along the street, Caguas, *492;* on a wall, Maricao, *1266;* on soil near Hato Arriba, about six kilometers south of Arecibo, *1395;* on the soil about ten kilometers north of Utuado, *1533;* on stones between Utuado and Adjuntas, *1661;* in an underground passage, Fort San Cristobal, San Juan, *1990.*

29. **Phormidium autumnale minus** Gardner, Mem. N. Y. Bot. Gard. **7**: 45. 1927.

In a reservoir at the Experiment Station, Rio Piedras, *203.* Type locality, Rio Piedras.

30. **Phormidium uncinatum** (Ag.) Gom. Jour. de Bot. **4**: 355. 1890.

*Oscillatoria uncinata* Ag. Flora, **10**: 631. 1827.

On the wall of the reservoir, Rio Piedras, *104 I;* near the reservoir west of the Experiment Station, Rio Piedras, *168;* on the wall of a house, Humacao, *646;* in a fountain south of the Plaza, Mayaguez, *996, 997;* in a brook on the road north of Maricao, *1264;* in a cement water-container by the road between Aibonito and Cayey, *1982.* Type locality, "Ad Tergestum supra limum ad fontes et prope il Boschetto ad pedem montis Spaccati."

31. **Phormidium epiphyticum** sp. nov. Plate 1, fig. 6.

Plants epiphytic, forming a dense layer completely surrounding the host; filaments 1 $\mu$ thick, straight or encircling the host; sheath very thin, hyaline,

becoming diffluent and relatively firm; trichomes light blue-green in color, 0.6–0.9 μ diam., not constricted: cells 2–3 times as long as the diameter, with homogeneous contents or rarely with a few relatively large granules; apical cell straight, not tapering, very blunt.

Epiphytic on *Lyngbya aestuarii*. Santurce, San Juan, May 27, 1903, *Howe, 2162d*, type.

The plants entwine so closely, extending mainly lengthwise of the host but in part winding around it, finally forming such a dense covering that they seem actually to kill it,—at least the host entirely disappears, leaving rope-like strands of the *Phormidium*. It seems closely related to *Lyngbya epiphytica* Hieron. but differs from it in being much smaller, and actually forms a mass of confluent *Phormidium* sheaths.

32. **Phormidium tenue marinum** var. nov. Plate 2, fig. 7.

Plants forming a thin stratum with the filaments intricately interwoven and tortuous and with distinct sheaths more or less diffluent; trichomes aeruginous, constricted at the cross-walls, finely granular, 2–2.3 μ diam., with cells 1.5–2.5 times as long as the diameter; apical cell straight, blunt, rounded, and wall not thickened.

Associated with other Myxophyceae, forming thin layers on sand rock in the lower littoral belt. San Juan, May 25, 1903, *Howe, 2112, and 2180*, the former the type.

This *Phormidium* entity seems about equally related to *P. tenue* (Menegh.) Gom. and to *P. molle* forma *tenuior* W. and G. S. West, both inhabitants of fresh water and the latter associated with *Lemna minor*. I have chosen to associate it with the former.

33. **Phormidium Hendersonii** Howe, Smithsonian Misc. Coll. **68**[11]: 2. 1918.

In pools on rocks, mouth of Guanica Harbor, *Howe, 6998, 6999;* on Cayo Don Luis, near Pt. Montalva, *Howe, 7192;* Salinas Cove, near Guanica Harbor, *Howe, 7204*. Type locality, Cayo Hutia, Cuba.

26. **PLECTONEMA** Thuret, Ann. Sci. Nat. Bot. VI, **1**: 375. 1875.

Type species, *Plectonema mirabile* (*P. Tomasinianum* Bornet).

1. Trichomes erect and parallel, much contorted in the sheath, 3–4 μ diam. ..... 4. *P. spirale.*
1. Trichomes more or less intricately entwined ..... 2.
2. Trichomes 5–6 μ diam.; cells quadrate to slightly longer ..... 3. *P. flexuosum.*
2. Trichomes less than 5 μ diam. ..... 3.
3. Trichomes 1.4–1.6 μ diam., quadrate, sheath very thin ..... 1. *P. tenuissimum.*
3. Trichomes 1.5–1.8 μ diam., quadrate to 2 times as long ..... 2. *P. murale.*

1. **Plectonema tenuissimum** Gardner, Mem. N. Y. Bot. Gard. **7**: 47, *pl. 10, f. 91.* 1927.

On the wall of a house in Maricao, *1049b*. Type locality, Maricao.

2. **Plectonema murale** Gardner, Mem. N. Y. Bot. Gard. **7**: 47, *pl. 9, f. 89.* 1927.

On the wall of a bridge, Juan Martin, Fajardo, *732c*. Type locality, Fajardo.

3. **Plectonema flexuosum** Gardner, Mem. N. Y. Bot. Gard. **7**: 47, *pl. 10, f. 90.* 1927.

On soil in the woods, Coamo Springs, *272b*. Type locality, Coamo Springs.

4. **Plectonema spirale** Gardner, Mem. N. Y. Bot. Gard. **7**: 46. 1927.

On an old pump in Maricao, *1276b*. Type locality, Maricao.

## 27. **SYMPLOCA** Kuetz. Phyc. Gen. 201. 1843.
(Original spelling *Synploca.*)

Type species, *Symploca Meneghiniana.*

1. Plants marine or in brackish water ..... 6.
1. Plants not marine ..... 2.
2. Trichomes 3 $\mu$ or more diam. ..... 3.
2. Trichomes less than 3 $\mu$ diam. ..... 4.
3. Trichomes not attenuated, 3.5–3.7 $\mu$ diam., pale yellowish; cells quadrate to slightly longer or shorter; apical cell blunt ..... 4. *S. Willei.*
3. Trichomes attenuated, 3.4–4 $\mu$ diam., aeruginous; cells 1.5–4 $\mu$ long; apical cell conical ..... 5. *S. muralis.*
4. Plants symbiotic, 0.6–0.8 $\mu$ diam., cells 3–5 times as long. 1. *S. symbiotica.*
4. Plants not symbiotic ..... 5.
5. Trichomes 1–1.3 $\mu$ diam.; cells 2–5 times as long; sheath rose pink. 2. *S. roseola.*
5. Trichomes 1.2–2 $\mu$ diam., cells 1.7–5 times as long; sheath hyaline. 3. *S. thermalis.*
6. Trichomes 6 $\mu$ or more in diameter ..... 6. *S. hydnoides fruticulosa.*
6. Trichomes less than 6 $\mu$ diameter ..... 7.
7. Plants forming dense cushions 1–2 cm. thick and impregnated with calcium carbonate; apical cell wall thickened ..... 7. *S. Howei.*
7. Plants forming a compact stratum of fascicles 3–5 mm. high; not impregnated with calcium carbonate; apical cell wall not thickened ..... 8.
8. Trichomes constricted at the cross walls ..... 8. *S. paludicola.*
8. Trichomes not constricted at the cross walls ..... 9. *S. atlantica.*

1. **Symploca symbiotica** Gardner, Mem. N. Y. Bot. Gard. **7:** 48, *pl. 10, f. 93.* 1927.

On a wall in Fort San Cristobal, San Juan, *2021b.* Type locality, San Juan.

2. **Symploca roseola** Gardner, Mem. N. Y. Bot. Gard. **7:** 49. 1927.

On damp rocks about ten kilometers north of Utuado, *1032b,* the type locality.

3. **Symploca thermalis** (Kuetz.) Rab. Fl. Eur. **2:** 153. 1865.

*Symphyothrix thermalis* Kuetz. Phyc. Gen., 200. 1843.

On a wall at the entrance to a bathing pool, Coamo Springs, *410;* on a wall towards the ocean, Arecibo, *1339.* Type locality, Abano, Italy.

4. **Symploca Willei** Gardner, Mem. N. Y. Bot. Gard. **7:** 48, *pl. 10, f. 92.* 1927.

On tree trunks, Coamo Springs, *281a;* on earth in Utuado, *1491.* Type locality, Utuado.

5. **Symploca muralis** Kuetz. Phyc. Gen. 201. 1843.

On damp leaves in a shady woods, Coamo Springs, *265.* Type locality, Nordhausen.

6. **Symploca hydnoides fruticulosa** Gom. Ann. Sci. Nat. Bot. VII, **16:** 107. 1892.

On the roots of *Rhizophora.* Marine. Culebra Island, *Howe, 4290.*

7. **Symploca Howei** sp. nov. PLATE 2, fig. 9, and text-figure 1.

Plants forming dense spongy tufts approximately 1–2 cm. thick, the mass more or less impregnated with granules of calcium carbonate but not forming solid incrustations; filaments very tortuous and densely intertwined, 6–8 $\mu$ diam.; sheath thin, smooth, homogeneous, hyaline; trichomes not constricted at the cross walls, neither attenuated nor capitate, 3.75–4.25 $\mu$ diam., with numerous

large vacuoles scattered promiscuously; terminal cell rounded and with a very slightly thickened terminal cell-wall; cells 1.25–2 times as long as broad; cross walls inconspicuous, not granular; sheath not changed in color by chlor-iodide of zinc.

Dredged in 7 meters of water off the mouth of Guanica Harbor, *Howe, 7416;* Cayo Don Luis, near Pt. Montalva, *Howe, 7186.* Both collected in July, 1915. The latter collection is the type.

The material of the type having been in liquid so long, the color has practically all disappeared from the trichomes. Otherwise it is in a good state of preservation.

TEXT-FIGURE 1. *Symploca Howei.* Type specimens, natural size.

The species is similar to *Phormidium ambiguum* Gom. in the characters of the filaments. It differs from that species in having longer cells, in its reaction to chlor-iodide of zinc, in not being constricted at the cross walls, and in its thick, dense, spongy habit of growth. *P. ambiguum* has not been reported as inhabiting the ocean. The trichomes have numerous large vacuoles. It is not possible to judge definitely as to whether this character is or is not prevalent in all stages of the life history. It is possibly only a senile condition.

8. **Symploca paludicola** sp. nov. PLATE 2, fig. 10.

Plants forming a dense stratum, with fascicles 3–5 mm. high; filaments moderately contorted and intertwined; sheath thin, smooth, homogeneous, hyaline, approximately 1 $\mu$ thick; trichomes not constricted at the dissepiments, neither attenuated nor uncinate at the apices, 4.8–5.2 $\mu$ diam.; cells 1.5–3 times

as long as broad, homogeneous, not granular; cell walls conspicuous, terminal wall of apical cell decidedly thickened.

Inhabiting mud among Mangroves, east of the mouth of Guanica Harbor. *Howe, 7313*, collected July 1, 1915, the type and only known collection.

This species of *Symploca* apparently has a near relative in *Symploca atlantica* Gom., described from the European coast. It differs from that species somewhat in habit, in having much longer cells, and in not being constricted at the dissepiments.

9. **Symploca atlantica** Gom. Ann. Sci. Nat. Bot. VII, **16**: 109, *pl. 2, fig. 5.* 1892.

Lt. Princess, and Cane Bay, St. Croix Island, Boergesen, *B, 1419.* Type locality, coast of France.

## Subfamily 4. SCHIZOTRICHEAE

1. Trichomes one to many in a more or less profusely branched sheath: sheaths coalescing and intertwined, forming acuminate fascicles or remaining prostrate ..... 2.
1. Trichomes more than one in an unbranched or slightly branched sheath or the false branching in both directions ..... 5.
2. Filaments for the most part forming symplocoid fascicles ..... 3.
2. Filaments densely intertwined, either forming a flocculent stratum, or erect and parallel, forming a continuous pulvinate stratum; sheath usually remaining hyaline ..... 4.
3. Sheaths at first hyaline in some species, always, however, becoming variously colored when older ..... 29. *Schizothrix.*
3. Sheaths always hyaline throughout their life history ..... 30. *Symplocastrum.*
4. Filaments usually intricate and prostrate, branching sparse. 28. *Hypheothrix.*
4. Filaments caespitose, often encrusted with calcium carbonate, forming a pulvinate stratum not fasciculate ..... 31. *Inactis.*
5. Trichomes few in a sheath, filaments intricately branching in both directions anywhere along the sheath, the trichomes partly in one and partly in another sheath ..... 32. *Lyngbyopsis.*
5. Trichomes few to many in a sheath; filaments not branching ..... 6.
6. Trichomes few in a sheath, not congested, capitate, diameter usually relatively large, cells short ..... 33a. *Hydrocoleum.*
6. Trichomes usually smaller, more in a sheath, usually congested, and cells longer ..... 33. *Microcoleus.*

### 28. HYPHEOTHRIX Kuetz. Phyc. Gen. 229. 1843.

Type species *Hypheothrix confervae.*

1. Trichomes very decidedly attenuated ..... 2.
1. Trichomes not at all or only slightly attenuated ..... 3.
2. Trichomes 5.2–5.4 $\mu$ diam., 4–6 cells attenuated; sheath hyaline, changing to pink or salmon-colored ..... 4. *H. Willei.*
2. Trichomes 7–7.5 $\mu$ diam., 7–10 cells attenuated; sheath hyaline. 5. *H. acutissima.*
3. Trichomes constricted at the cross walls, 4.5–5 $\mu$ diam.; sheath slightly lamellose ..... 3. *H. parciramosa.*
3. Trichomes not constricted; sheath not lamellose ..... 4.
4. Cells 8–12.5 $\mu$ long; trichomes 1.7–2 $\mu$ diam. ..... 1. *H. longiarticulata.*
4. Cells less than 8 $\mu$ long ..... 5.
5. Trichomes 2.4–2.8 $\mu$ diam., apical cell blunt-conical ..... 2. *H. symplocoides.*
5. Trichomes 1.5–3 $\mu$ diam.; apical cell acute-conical ..... 6. *H. arenaria.*

1. **Hypheothrix longiarticulata** Gardner, Mem. N. Y. Bot. Gard. **7**: 50, *pl. 10, f. 95.* 1927.

On a wall in Fort San Cristobal, San Juan, *2022a.* Type locality, San Juan.

2. **Hypheothrix symplocoides** Gardner, Mem. N. Y. Bot. Gard. **7**: 51, *pl. 10, f. 97.* 1927.

On the soil in a forest near Hacienda Catalina, Palmer, *754, 760.* Type locality, near Palmer.

3. **Hypheothrix parciramosa** Gardner, Mem. N. Y. Bot. Gard. **7**: 50, *pl. 10, f. 96.* 1927.

With moss at the "Campo" in Maricao, *1228.* Type locality, Maricao.

4. **Hypheothrix Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 52, *pl. 10, f. 98.* 1927.

On rocks west of Humacao, *613b.* Type locality, near Humacao.

5. **Hypheothrix acutissima** Gardner, Mem. N. Y. Bot. Gard. **7**: 49, *pl. 10, f. 94.* 1927.

On moss along the road north of Maricao, *1271a.* Type locality, near Maricao.

6. **Hypheothriz arenaria** (Berk.) De Toni, Syll. Alg. **5**: 342. 1907.

*Scytonema arenarium* Berkeley, Ann. Nat. Hist. **3**: 327. 1839.

On the wall of a cemetery, San Juan, *94;* on rocks west of Humacao, *613c.* Type locality, Tasmania.

### 29. **SCHIZOTHRIX** Kuetz. Phyc. Gen. 230. 1843.

Type species, *Schizothrix fuscescens.*

1. Trichomes 6–6.2 μ diam.; sheath hyaline, changing to pale purple. 6. *S. chalybea minor.*
1. Trichomes less than 6 μ diam. ..... 2.
2. Trichomes 3.3–3.6 μ diam.; sheath hyaline, changing to deep honey-color ..... 3. *S. mellea.*
2. Trichomes less than 3 μ diam. ..... 3.
3. Trichomes 2.2–2.4 μ diam.; sheath honey colored ..... 4. *S. mellea minor.*
3. Sheath not honey-colored ..... 4.
4. Trichomes 2.3–2.5 μ diam.; sheath dark violet ..... 1. *S. violacea.*
4. Trichomes 2.4–2.7 μ diam.; sheath hyaline .... 2. *S. thelephoroides minor.*
4. Trichomes 2.4–2.8 μ diam.; sheath rose-pink ..... 5. *S. rosea.*

1. **Schizothrix violacea** Gardner, Mem. N. Y. Bot. Gard. **7**: 52, *pl. 11, f. 99.* 1927.

On limestone between Arecibo and Utuado, *1476g.* Type locality, near Arecibo.

2. **Schizothrix thelephoroides minor** Gardner, Mem. N. Y. Bot. Gard. **7**: 54, 1927,—under *Microcoleus sociatus minor* in original publication, through error.

In the Luquillo Mountains, Porto Rico.

3. **Schizothrix mellea** Gardner, Mem. N. Y. Bot. Gard. **7**: 53. 1927.

On red soil by the road to Hacienda Catalina, Palmer, *776a, 778a;* on rocks at Maricao, *1031a, 1033a, 1037c, 1043a;* on soil by the road to Monte Montoso, Maricao, *1071c, 1077d;* on rocks near Maricao, *1142;* on earth at Hacienda Holm, Mayaguez, *1177a, 1179a;* on cliff, Utuado to Adjuntas, *Howe, Britton, and Cowell, 1241a.* Type locality, near Palmer.

4. **Schizothrix mellea minor** Gardner, Mem. N. Y. Bot. Gard. **7**: 53. 1927.

On rocks near Maricao, *1032a;* on rocks in the Arroyo de los Corchos, *1732.* Type locality, Maricao.

5. **Schizothrix rosea** Gardner, Mem. N. Y. Bot. Gard. **7**: 53. 1927.

On red earth, Mayaguez, *880c*. Type locality, Mayaguez.

6. **Schizothrix chalybea minor** Gardner, Mem. N. Y. Bot. Gard. **7**: 53. 1927, under *Schizothrix rosea* in the original publication.

On rocks in the vicinity of San Lorenzo, *519;* on earth at Hacienda Holm, Mayaguez, *1176*. Type locality, near San Lorenzo.

30. **SYMPLOCASTRUM** Gom. Ann. Sci. Nat. Bot. VII, **15**: 294, 1892, as a subgenus of *Schizothrix*.

Type species *Symplocastrum Friesii*, based on *Oscillatoria Friesii* Agardh.

1. **Symplocastrum Brittoniae** sp. nov. Plate 2, fig. 11.

Plants forming slender symplocoid fascicles coalescing more or less at the base and about 5 mm. high; filaments branching more or less freely at the base but simple above throughout the greater portion of their length, containing 1–3 trichomes at the base and but a single one above, intertwined and closely appressed, forming acute fascicles, 15–20 $\mu$ diam. above in the unbranched portion, with closed, acute apices; trichomes constricted at the cross-walls; cells cylindrical, homogeneous to densely granular, aeruginous, 3.7–4 $\mu$ diam., 2–4.5 times as long as the diam.; apical cell blunt rounded, not capitate; sheath hyaline, homogeneous.

Growing on mosses, etc., summit of El Yunque, along Catalina-Yunque trail, Luquillo Mts. Collected by *Mrs. Elizabeth G. Britton, no. 7648*, Feb. 1923. The type.

This species of *Symplocastrum* resembles closely *S. Friesii* (Ag.) Kirch. in the characters of the trichomes but has cylindrical instead of conical apical cells and the cells average considerably longer. The sheaths are homogeneous instead of being in layers.

31. **INACTIS** Kuetz. Phyc. Gen. 202. 1843.

Type species, *Inactis tornata*.

1. **Inactis ecalcarea** Gardner, Mem. N. Y. Bot. Gard. **7**: 54, *pl. 11, f. 100*. 1927.

In stones in the Turabo River, near Caguas, *481a*. Type locality, near Caguas.

32. **LYNGBYOPSIS** Gardner, Mem. N. Y. Bot. Gard. **7**: 54. 1927.

Type species, *Lyngbyopsis Willei*.

1. **Lyngbyopsis Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 55, *pl. 11, f. 1*. 1927.

On rocks in a brook about five kilometers north of Utuado, *1597*. Type locality, near Utuado.

33. **MICROCOLEUS** Desm. Catalogue des plantes, 7. 1832.

Type species, *Microcoleus terrestris* [*M. vaginatus* (Vauch.) Gom.]

1. Plants growing in salt water, trichomes 1.5–2 $\mu$ diam., very acute. 8. *M. tenerrimus*.
1. Plants growing in fresh water ..... 2.
2. Trichomes with various shades of blue-green ..... 4.
2. Trichomes not blue-green ..... 3.
3. Trichomes up to 60 in a sheath, 1.7–1.9 $\mu$ diam., purplish drab, apices straight or uncinate, apical cell acuminate ..... 1. *M. purpureus*.
3. Trichomes up to 75 in a sheath, 1.8–2.5 $\mu$ diam., yellowish green, apical cell acute-conical; sheath ample ..... 3. *M. sociatus minor*.
4. Trichomes capitate ..... 5.
4. Trichomes not capitate ..... 6.

5. Trichomes 3.5–4 $\mu$ diam.....5. *M. vaginatus monticola.*
5. Trichomes 4.4–6.6 $\mu$ diam.....6. *M. vaginatus Vaucherii.*
6. Trichomes 5–7 $\mu$ diam.; 3–5 apical cells acuminate
7. *M. paludosus acuminatus.*
6. Trichomes less than 5 $\mu$ diam.....7.
7. Trichomes 15–20 in a sheath, 1.8–2.2 $\mu$ diam.; apical cell acuminate.
2. *M. acuminatus.*
7. Trichomes 30–60 in a sheath, 4.6–5 $\mu$ diam.....4. *M. amplus.*

1. **Microcoleus purpureus** Gardner, Mem. N. Y. Bot. Gard. **7:** 56, *pl. 11, f. 4.* 1927.

On the wall of an old cemetery, San Juan, *130a;* on damp earth, Humacao, *548;* on a wall in Fort San Cristobal, San Juan, *1991d;* Type locality, San Juan.

2. **Microcoleus acutissimus** Gardner, Mem. N. Y. Bot. Gard. **7:** 55, *pl. 11, f. 2.* 1927.

In a reservoir near the Experiment Station, Rio Piedras, *200b;* on a church wall, Sabana Grande, *952d;* on the earth between Hatillo and Arecibo, *1366b;* on a wall in Fort San Cristobal, San Juan, *1991e.* Type locality, Sabana Grande.

3. **Microcoleus sociatus minor** Gardner, Mem. N. Y. Bot. Gard. **7:** 57, *pl. 11, f. 6.* 1927.

On the wall of an old cemetery, San Juan, *130b;* on a wall near the bridge, Santurce, *143b;* in a reservoir near the Experiment Station, Rio Piedras, *200;* on a wall by the baths, Coamo Springs, *254b;* on the wall of a church, Sabana Grande, *952b;* in depressions in the limestone between Hatillo and Arecibo, *1392a;* on the walls in Fort San Cristobal, San Juan, *2006c, 2020a, 2021c.* Type locality, between Hatillo and Arecibo.

4. **Microcoleus amplus** Gardner, Mem. N. Y. Bot. Gard. **7:** 56, *pl. 11, f. 3.* 1927.

In mud by the bridge over the stream, Rio Piedras, *72;* on the way to the Experiment Station, Rio Piedras, *179;* on earth, bank of Turabo river, Caguas, *489;* on the earth, Utuado, *1505, 1573.* Type locality, Rio Piedras.

5. **Microcoleus vaginatus monticola** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **15:** 350. 1892.

*Chthonoblastus monticola* Kuetz. Phyc. Gen. 197. 1843.

On rocks by the road from San Lorenzo, *527c.* Type locality, Trieste.

6. **Microcoleus vaginatus Vaucherii** (Kuetz.) Gom. Ann. Sci. Nat. Bot. VII, **15:** 356. 1892.

*Chthonoblastus Vaucheri* Kuetz. Phyc. Gen. 197. 1843.

On earth near the bridge, Caguas, *457a.*

7. **Microcoleus paludosus acuminatus** Gardner, Mem. N. Y. Bot. Gard. **7:** 57, *pl. 11, f. 5.* 1927.

On a wall in Fort San Cristobal, San Juan, *2013a.* Type locality, San Juan.

8. **Microcoleus tenerrimus** Gom. Ann. Sci. Nat. Bot. VII, **15:** 355, *pl. 14, figs. 9–11.* 1892.

On *Rhizophora* roots in the littoral belt, Culebra Island, *Howe, 4281a.* Type locality, Guadeloupe.

A considerable number of specimens of this species were detected in association with *Lyngbya Baculum aeruginea* Gardner.

Gomont (loc. cit.) quotes as a synonym *Microcoleus oligothrix* Crouan, *in* "Schramm et Mazé, Essai de classification des Algues de la Guadalupe, 30. 1865; Mazé et Schramm" ibidem, "2nd edition p. 20." In the second edition, at least, *Chthonoblastes oligothrix* Kuetzing, collected in Cuba, is quoted as the material upon which Crouan based the combination *M. oligothrix*. If Crouan's and Kuetzing's material are of the same species it would seem that the proper combination for the species under discussion would be *Microcoleus oligothrix* (Kuetz.) Gom. since Kuetzing gave a good diagnosis of the species in Sp. Alg. 261, 1843, and Cuba would be the type locality. Crouan's name is a *nomen nudum*.

### 33a. **HYDROCOLEUM** Kuetz. Phyc. Gen. 196. 1843.

Type species, *Hydrocoleum homoeotrichum*.

1. Sheaths pinkish-red at maturity; trichomes 5–6 μ diam.....1. *H. rufescens*.
1. Sheaths hyaline at maturity; trichomes larger.....2.
2. Trichomes 18–24 μ diam.....2. *H. cantharidosmum*.
2. Trichomes 8–16 μ diam.....3.
2. Trichomes 6.3–6.5 μ diam.....5. *H. Boergesenii*.
3. Filaments distinct for the most part.....3. *H. lyngbyaceum*.
3. Filaments confluent.....4. *H. lyngbyaceum rupestre*.

**1. Hydrocoleum rufescens** Gardner, Mem. N. Y. Bot. Gard. **7**: 57. 1927.

On red soil at the Experiment Station, Mayaguez, *972*. Type locality, Mayaguez.

**2. Hydrocoleum cantharidosmum** (Mont.) Gom. Jour. de Bot. **4**: 353. 1890.

*Lyngbya cantharidosma* Montagne, Hist. Nat. Canar. **3**: 188, 1840.

Forming yellowish gelatinous masses on rocks, Culebra Island, *Howe, 4250;* St. Croix, *Boergesen, 1465, 1489;* Cruxbay, St. Jan, *Boergesen, 2112*. Type locality, Canary Islands.

**3. Hydrocoleum lyngbyaceum** Kuetz. Sp. Alg. 259. 1849. (description) Tab. Phyc. **1**: 37, *pl. 51, f. 1*. 1849 (illustration).

In each of these publications the author cites the other work. It is difficult to determine which publication actually came from the press first.

On stones and on other algae, San Juan, *Howe, 2116;* Santurce, San Juan, *Howe, 2199;* Point Borinquen, near Aguadilla, *Howe, 2437 and 2457*. Epiphytic on *Cymopolia* sp., Muertos Island (Caja de Muertos), *Howe, 7478*. Lt. Princess, St. Croix, *Boergesen, 15;* St. Thomas, *Boergesen, 1085*. Type locality, coast of France.

**4. Hydrocoleum lyngbyaceum rupestre** Kuetz. (loc. cit.).

On rocks and on other algae, in the littoral and upper sublittoral belts, Santurce, San Juan, *Howe, 1903, 1925, 1964, 1988, 2007, 2113;* Point Borinquen, near Aguadilla, *Howe, 2478;* epiphytic, Aguadilla, *Howe, 2381;* Culebra, *Howe, 4354;* east of Guanica Harbor, on stones, *Howe, 7310 and 7321;* on other algae and stones, east of the mouth of Guanica Harbor, *Howe, 7322;* Muertos Island (Caja de Muertos), *Howe, 7501*. Type locality, Calvados, northern France.

**5. Hydrocoleum Boergesenii** sp. nov.

Filaments moderately elongated, relatively narrow and smooth, unbranched, closed at the apices, 30–50 μ diam., enclosing 1–7 trichomes in any cross diameter, but many more throughout their entire length; sheath hyaline, homogeneous, moderately firm; trichomes pale aeruginous, 6.3–6.5 μ diam., scattered or entwined about each other within the sheath, attenuated at the apices, straight, not capitate; apical ecll blunt-conical, in part with a very slightly thickened end wall; cells short, 1.8–2.2 μ long, with homogeneous contents.

Christianssted's Lagoon, St. Croix, spring, 1892, *F. Boergesen*. Type.

Only a single small specimen of this species appears in the collections of Dr. Boergesen from the Danish West Indies, hardly sufficient to give much character to the habit of growth. It has overlapping characters of the two genera, *Hydrocoleum* and *Microcoleus*. The shortness of the cells and the paucity of trichomes within the sheath are characters linking it with the former, but the trichomes are noncapitate, opposite to the condition said to be characteristic of that genus. The number of trichomes within a sheath is usually larger in the genus *Microcoleus* and they are usually relatively narrow, but some are reported to be as wide or even wider than these of *H. Boergesenii* and the apices may or may not be capitate.

### Suborder 2. **HETEROCYSTINEAE**

1. Filaments unbranched; trichomes not tapering, monosiphonous. ..... 4. NOSTOCACEAE.
1. Filaments branched (except in *Microchaete*) ..... 2.
2. With true branching; filaments polysiphonous or, more rarely, monosiphonous ..... 7. STIGONEMATACEAE.
2. With false branching ..... 3.
3. Filaments and trichomes not normally tapering upwards, branching single or geminate ..... 5. SCYTONEMATACEAE.
3. Filaments tapering, often terminating in a narrow hair on the upper end ..... 6. RIVULARIACEAE.

### Family 4. **NOSTOCACEAE**

1. Trichomes more or less contorted and with a more or less ample sheath, in part free floating ..... 2.
1. Trichomes usually short and straight, sheath relatively thin ..... 3.
2. Colonies more or less definite in form ..... 35. *Nostoc.*
2. Colonies without definite form, or the filaments floating free. ..... 34. *Anabaena.*
3. Heterocysts single and terminal ..... 36. *Cylindrospermum.*
3. Heterocysts several, intercalary ..... 37. *Nodularia.*

### 34. **ANABAENA** Bory, Dict. Class. **1**: 307. 1822.

Type species, *Anabaena oscillarioides.*

1. Plants producing but one, or rarely two, spores ..... 5. *A. unispora.*
1. Plants producing more than one spore, if these are known ..... 2.
2. Plants epiphytic; trichomes 5–5.3 $\mu$ diam.; heterocysts spherical, 6–6.3 $\mu$ diam. ..... 10. *A. epiphytica.*
2. Plants not epiphytic ..... 3.
3. Trichomes 2.3–2.5 $\mu$ diam.; cells compressed-spherical; heterocysts spherical, 2.6–3 $\mu$ diam. ..... 1. *A. delicatissima.*
3. Trichomes more than 2.5 $\mu$ diam. ..... 4.
4. Resting spores beginning to develop near the center between the heterocysts, i. e. centripetal ..... 5.
4. Resting spores beginning next to the heterocysts, i. e. centrifugal ..... 7.
5. Resting spores 2–4-catenate; cells subspherical, 3.2–4 $\mu$ diam. ..... 2. *A. aeruginosa.*
5. Resting spores more than 4-catenate ..... 6.
6. Resting spores seriate or discontinuous, 5–6.5 $\mu \times$ 6–7.5 $\mu$, walls hyaline; trichomes 3.5–4.5 $\mu$ diam. ..... 3. *A. subtropica.*
6. Resting spores 10–15-catenate, 7–8 $\mu \times$ 12–15 $\mu$, wall yellowish; trichomes 4.8–5.2 $\mu$ diam. ..... 6. *A. lutea.*
7. Trichomes 7–8 $\mu$ diam.; heterocysts spherical, 10 $\mu$ diam. ..... 11. *A. portoricensis.*
7. Trichomes 7 $\mu$ or less in diam. ..... 8.
8. Heterocysts cylindrical, 5–6 $\mu \times$ 9–12 $\mu$; cells cylindrical, 4.8–5.2 $\mu$ diam., quadrate ..... 9. *A. Willei.*
8. Heterocysts cylindrical, 7.5–8 $\mu$ diam., with thickened end walls; cells 6.2–7 $\mu$ diam. ..... 12. *A. marina.*
8. Heterocysts spherical to dolioform ..... 9.

9. Heterocysts usually dolioform, 5 $\mu$ × 8–10 $\mu$, cells cylindrical, 4–4.5 $\mu$ × 8–10 $\mu$; spores about 10 $\mu$ × 20 $\mu$ ..... 4. *A. mediocris.*
9. Heterocysts spherical to subspherical ..... 10.
10. Spores 1–3-catenate, 8–10 $\mu$ × 20–40 $\mu$; apical cell blunt. 7. *A. oscillarioides.*
10. Spores 2–8-catenate, usually smaller; apical cell conical. 8. *A. oscillarioides stenospora.*

1. **Anabaena delicatissima** Gardner, Mem. N. Y. Bot. Gard. **7:** 61, *pl. 12, f. 12.* 1927.

Collected by *Dr. W. C. Earle* in the vicinity of Manati, Porto Rico. Type locality, Manati, Porto Rico.

2. **Anabaena aeruginosa** Gardner, Mem. N. Y. Bot. Gard. **7:** 60, *pl. 12, f. 11.* 1927.

In a stream about five kilometers east of Coamo, *237b.* Type locality, near Coamo.

3. **Anabaena subtropica** Gardner, Mem. N. Y. Bot. Gard. **7:** 59, *pl. 12, f. 9.* 1927.

In a stream about five kilometers east of Coamo, *235b;* in a pool between Hatillo and Arecibo, *1345.* Type locality, near Coamo.

4. **Anabaena mediocris** Gardner, Mem. N. Y. Bot. Gard. **7:** 61, *pl. 12, f. 13.* 1927.

In a ditch near Mayaguez, *1004;* in a pool between Hatillo and Arecibo, *1355;* Manati, *Walter C. Earle.* Type locality, Mayaguez.

5. **Anabaena unispora** Gardner, Mem. N. Y. Bot. Gard. **7:** 59, *pl. 12, f. 8.* 1927.

In a pool near the Park, Santurce, *44c, 49a, 51d.* Type locality, Santurce.

6. **Anabaena lutea** Gardner, Mem. N. Y. Bot. Gard. **7:** 58, *pl. 12, f. 7.* 1927.

In a small stream about five kilometers east of Coamo, *237c;* on the earth about five kilometers south of Adjuntas, *1665.* Type locality, near Adjuntas.

7. **Anabaena oscillarioides** Bory, Dict. Class. **1:** 308. 1822.

On red mud, Mayaguez, *894;* on the earth and in pools between Hatillo and Arecibo, *1342, 1404;* in stagnant water and in a pool by the stream about five kilometers north of Utuado, *1585, 1588;* in a ditch in wet fields, Ponce, *1670d.*

8. **Anabaena oscillarioides stenospora** Born. & Flah. Ann. Sci. Nat. Bot. VII, **7:** 236. 1888.

Collected by *Dr. W. C. Earle* in the vicinity of Manati, Porto Rico. Type locality not definitely stated but is somewhere in the United States.

9. **Anabaena Willei** Gardner, Mem. N. Y. Bot. Gard. **7:** 60, *pl. 12, f. 10.* 1927.

In a stream about five kilometers east of Coamo, *237;* in a ditch in wet fields, Ponce, *1670a;* in a pool, Jayuya, *1750.* Type locality, Jayuya.

10. **Anabaena epiphytica** Gardner, Mem. N. Y. Bot. Gard. **7:** 61. 1927.

Among water plants near the reservoir at the Experiment Station, Rio Piedras, *154b;* in a water basin west of the Experiment Station, Rio Piedras, *1946a, 1947.* Type locality, near Rio Piedras.

11. **Anabaena portoricensis** Gardner, Mem. N. Y. Bot. Gard. **7:** 62, *pl. 12, f. 14.* 1927.

In a ditch in wet fields, Ponce, 1670b. Type locality, Ponce.

12. **Anabaena marina** sp. nov.

Filaments mainly parallel and closely associated in a very soft, homogeneous secretion of indefinite expansion, often forming symplocoid fascicles around the margin, bright green in color; cells subcylindrical, constricted at the cross walls, 6.2–7 μ diam., quadrate to slightly longer than broad; heterocysts cylindrical to slightly dolioform, 7.5–8 μ diam., about one-third longer than broad, usually with thickened end walls; spores unknown.

Baliena Bay, near Guanica, *Howe, 6940;* at the mouth of Guanica Harbor, *Howe 6992b;* reefs and cays west of the mouth of Guanica Harbor, *Howe, 7279.* Lt. Princess, St. Croix, *Boergesen;* St. Croix Island, Coakley Bay, *Boergesen, 1360;* St. Jan, Cruz Bay, *Boergesen 2109.* Type, *Howe, 7279.*

The relatively large size of the cells, the shape and structure of the heterocysts, in connection with the marine habitat, rather unusual for the genus *Anabaena*, make this species seem amply distinct from all others as to warrant assigning to it specific rank. Unfortunately the absence of spores in all of the specimens at hand leaves some doubt as to its identity. The measurements indicate an affinity with *Anabaena Thwaitesii* (Ralfs) Cook, a species found inhabiting brackish water.

35. **NOSTOC** Vauch. Hist. Conferv. 203. 1803.

Type species, *Nostoc commune.*

1. Colonies exceedingly irregular and variable in form and size at maturity; tegument soft, gelatinous ..... 2.
1. Colonies varying from spherical to irregular at maturity; tegument firm ..... 7.
2. Cells spherical to subspherical ..... 3.
2. Cells cylindrical to subcylindrical ..... 5.
3. Resting spores unknown; heterocysts spherical, one- to several-catenate, 7 μ diam. ..... 7. *N. commune.*
3. Resting spores known, spherical, ellipsoidal to cylindrical ..... 4.
4. Heterocysts subspherical to oblong, 4.5–6 μ diam.; spores spherical, 6–7 μ diam. ..... 1. *N. piscinale.*
4. Heterocysts subspherical, 3 μ diam.; spores spherical to slightly dolioform, 4–6 μ diam.; spore wall yellowish brown. 5. *N. humifusum.*
5. Resting spores unknown; heterocysts 4–5 μ diam.; cells 2.2–3.5 μ. 4. *N. margaritaceum.*
5. Resting spores known ..... 6.
6. Heterocysts spherical, 3 μ diam.; spores 3.8–4.2 μ × 6.8–7.5 μ; cells 2.5 μ × 5 μ ..... 2. *N. simulans.*
6. Heterocysts subspherical to oblong, 6–7 μ × 6–14 μ; spores same shape, 6–8 μ × 14–19 μ; cells 4 μ × 4–16 μ. 3. *N. ellipsosporum.*
7. Resting spores unknown ..... 8.
7. Resting spores known ..... 10.
8. Colonies 5–8 cm. diam.; cells spherical to compressed lengthwise of the trichome, 4.6–5.2 μ diam.; heterocysts 5.8–6.4 μ diam. ..... 6. *N. membranaceum.*
8. Colonies less than 1 cm. diam. ..... 9.
9. Colonies 1 mm. or less diam.; cells 1–1.2 μ diam. ..... 9. *N. minutissimum.*
9. Colonies 2 mm. or less diam.; cells 3.6–4.8 μ diam. protoplast violet. 11. *N. Brittonii.*
10. Colonies less than 1 mm. diam. ..... 11.
10. Colonies 1 mm. or more diam. ..... 12.
11. Colonies up to 0.5 mm.; cells spherical to dolioform, olive-green to violet; heterocysts spherical, 6–7.4 μ diam.; sheath almost transparent ..... 12. *N. album.*
11. Colonies up to 0.6 mm. diam.; cells subspherical to compressed, 3–3.6 μ diam.; heterocysts spherical, 6–6.5 μ diam., spores spherical, 4.7–5.6 μ diam. ..... 13. *N. sphaerosporum.*
12. Trichomes 4–5 μ diam.; resting spores oval, 5 μ × 7 μ diam., with dark walls ..... 8. *N. sphaericum.*

12. Trichomes 3.7–4 μ diam.; resting spores cylindrical, 7–9 μ × 14–20 μ ..... 10. *N. Willei.*
12. Trichomes 1.4–1.8 μ diam.; resting spores subcylindrical, 3 μ × 6 μ ..... 14. *N. ellipsoideum.*

1. **Nostoc piscinale** Kuetz. Phyc. Gen. 208. 1843.

In a stream about five kilometers east of Coamo, *235, 1888.* Type locality, Bruckdorf, not far from Halle.

2. **Nostoc simulans** Gardner, Mem. N. Y. Bot. Gard. **7:** 63. 1927.

In cavities in the wall of a house at Maricao, *1117.* Type locality, Maricao.

3. **Nostoc ellipsosporum** (Desm.) Rab. Fl. Eur. **2:** 169. 1865.

*Hormosiphon ellipsosporus* Desm. Crypt. Fr. éd. II, n. 133.

On rocks in the shade, Coamo Springs, *269;* on bark in a ravine, Coamo Springs, *1905a.* Type locality, France.

4. **Nostoc margaritaceum** (Kuetz.) Rab. Fl. Eur. **2:** 169. 1865.

*Hormosiphon margaritaceus* Kuetz. Sp. Alg. 301. 1849.

On chalk rocks by the road between Arecibo and Utuado, *1469a.* Type locality, France.

5. **Nostoc humifusum** Carmichael; Harvey, *in* Hook. British Flora, **2:** 399. 1833.

On wet rocks between Utuado and Adjuntas, *1645.* Type locality, Appin.

6. **Nostoc membranaceum** Gardner, Mem. N. Y. Bot. Gard. **7:** 64. 1927.

On sand rocks by the banks of the Rio Grande, near Sabana Grande, *942;* in a water drain near a stream, Maricao, *1147.* Type locality, near Sabana Grande.

7. **Nostoc commune** Vauch. Hist. Conferv. 222. 1803.

In a stream about five kilometers east of Coamo, *243;* on wet sandy soil, Santurce, *Heller, 26;* on bank of a ditch, near Coamo Springs, *Underwood & Griggs, 461;* Alta de la Bandera, near Adjuntas, *E. G. Britton and Delia W. Marble, 2147;* on hard dry ground in a woods near Guanica, *Howe, 2632;* on red soil, Salinas de Guanica, *Britton, Cowell, and Brown, 4921.* Type locality not mentioned by Vaucher.

8. **Nostoc sphaericum** Vauch. Hist. Conferv. 223, *pl. 16 f. 2.* 1803.

On rocks in a ravine, Coamo Springs, *1908a.* Type locality, Abano Baths, Italy.

9. **Nostoc minutissimum** Kuetz. Phyc. Gen. 204. 1843.

On the rocks in a waterfall on the way from Jayuya, *1796.* Type locality, Dalmatia.

10. **Nostoc Willei** Gardner, Mem. N. Y. Bot. Gard. **7:** 62. 1927.

On trunks of trees in the woods, Coamo Springs, *267.* Type locality, Coamo Springs.

11. **Nostoc Brittonii** Gardner, Mem. N. Y. Bot. Gard. **7:** 62. 1927.

On shaded earth near the "Campo," south of Maricao, *1229c, 1290a.* Type locality, near Maricao.

12. **Nostoc album** Gardner, Mem. N. Y. Bot. Gard. **7**: 63. 1927.

On moss by a stream near Maricao, *1149*. Type locality, near Maricao.

13. **Nostoc sphaerosporum** Gardner, Mem. N. Y. Bot. Gard. **7**: 64. 1927.

On bark near Utuado, *1506a*. Type locality, near Utuado.

14. **Nostoc ellipsoideum** Gardner, Mem. N. Y. Bot. Gard. **7**: 64. 1927.

On rocks in the vicinity of Jayuya, *1797*. Type locality, near Jayuya.

36. **CYLINDROSPERMUM** Kuetz. Phyc. Gen. 211. 1843.

Type species, *Cylindrospermum majus*.

1. Resting spores 10–15 μ diam., 20–30 μ long, wall papillate, dark. . 1. *C. majus.*
1. Resting spores smooth . . . . . 2.
   2. Cells cylindrical, 2–2.5 μ diam., 2 times as long; spores 8–9 μ diam., 18–20 μ long . . . . . 3. *C. minutissimum.*
   2. Cells 3–4.7 μ diam., 4 μ long; spores 9–12 μ diam., 10–20 μ long; walls a dark golden color . . . . . 2. *C. muscicola.*

1. **Cylindrospermum majus** Kuetz. Phyc. Gen. 212. 1843.

In a stream about five kilometers east of Coamo, *221c*. Type locality, "Wangerooge."

2. **Cylindrospermum muscicola** Kuetz. Phyc. Germ. 173. 1845.

On damp earth near the road west of Humacao, *585*. Type locality, "im Oberharz."

3. **Cylindrospermum minutissimum** Collins, Erythea, **4**: 120. 1896.

On a wall in the town of Maricao, *1275;* on damp rocks about twelve kilometers north of Utuado, *1518*. Type locality, Malden, Massachusetts.

37. **NODULARIA** Mertens, *in* Juergens, Alg. aquat. Dec. XV, no. 4, 1822.

Type species, *Nodularia spumigena*.

1. Filaments 9–10.5 μ diam.; trichomes 8.4–8.8 μ diam. . . . . 1. *N. Willei.*
1. Filaments 4.7–5 μ diam.; trichomes 3–3.8 μ diam. . . . . 2. *N. epiphytica.*

1. **Nodularia Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 65, *pl. 12, f. 15*. 1927.

In a pool near Laguna Guanica, *1817a*. Type locality, Laguna Guanica.

2. **Nodularia epiphytica** Gardner, Mem. N. Y. Bot. Gard. **7**: 65, *pl. 12, f. 16*. 1927.

On the bark of trees in shady places, Coamo Springs, *282d;* on limestone, Hato Arriba, Arecibo, *1415a*. Type locality, Arecibo.

Family 5. **SCYTONEMATACEAE**

1. Plants unbranched; heterocysts basal and intercalary; cells cylindrical . . . . . 38. *Microchaete.*
1. Plants unbranched; heterocysts intercalary; cells moniliform. 38a. *Hormothamnium.*
1. Plants with false branching; heterocysts intercalary . . . . . 2.
   2. Branching usually geminate between the heterocysts; sheath usually thick, more or less colored, and in part lamellose. 39. *Scytonema.*
   2. Branching usually single between the heterocysts . . . . . 3.

3. Filaments usually relatively short; sheaths thick and colored; usually aerial ..... 40. *Hassallia.*
3. Filaments usually longer, with small diameter, hyaline sheath, and aquatic ..... 41. *Tolypothrix.*

38. **MICROCHAETE** Thur. Ann. Sci. Nat. Bot. VI, **1**: 378. 1875.

Type species, *Microchaete grisea.*

1. **Microchaete tenera tenuior** Gardner, Mem. N. Y. Bot. Gard. **7**: 71. 1927.

Among Hepaticae by the road near Adjuntas, *1571.* Type locality, near Adjuntas.

38a. **HORMOTHAMNIUM** Grunow, Reise der Novara, Alg. 31. 1868.

Type species *H. enteromorphoides.*

1. **Hormothamnium enteromorphoides** Grunow (loc. cit.) *pl. 1, f. 25.* 1868.

In the lower littoral and upper sublittoral belts. San Juan, *Howe, 2115, 2225, and 2290;* Guanica Harbor, *Howe, 2590;* Culebra Island, *Howe, 4221;* near Tallaboa, *Howe, 4417.* Type locality, Guadeloupe Island.

39. **SCYTONEMA** Ag. Syst. Alg. 38. 1824.

Type species *Scytonema Myochrous* based on *Conferva Myochrous* Dillwin.

1. Plants marine ..... 32.
1. Plants not marine ..... 2.
2. Sheath homogeneous or lamellose; if lamellose, the lamellae parallel ..... 3.
2. Sheath lamellose, the lamellae divergent, at times ocreate ..... 24.
3. Sheath homogeneous ..... 4.
3. Sheath lamellose with parallel lamellae ..... 18.
4. Sheath always hyaline ..... 5.
4. Sheath more or less colored ..... 7.
5. Filaments 6–8 $\mu$ diam.; trichomes 5.5–6.5 $\mu$ diam. at the apices ..... 3. *S. tenue.*
5. Filaments over 8 $\mu$ diam ..... 6.
6. Filaments 10–13 $\mu$ diam.; trichomes 6–9 $\mu$ diam. at the apices. 6. *S. subgelatinosum.*
6. Filaments 28–32 $\mu$ diam.; trichomes 18–25 $\mu$ diam. at the apices. 22. *S. lyngbyoides.*
7. Trichomes 2–3 $\mu$ diam.; sheath hyaline when young, becoming dark when old ..... 1. *S. tenuissimum.*
7. Trichomes more than 3 $\mu$ diam ..... 8.
8. Trichomes torulose, at least in the apical region ..... 9.
8. Trichomes non-torulose ..... 11.
9. Apices of the filaments very decidedly thickened ..... 21. *S. capitatum.*
9. Apices of the filaments not perceptibly thickened ..... 10.
10. Filaments 200–300 $\mu$ long, 12–16 $\mu$ diam., trichomes 10–12 $\mu$ diam ..... 15. *S. tenellum.*
10. Filaments much longer, 20–25 $\mu$ diam ..... 23. *S. Milleri majus.*
11. Filaments up to 20 $\mu$ or more diam ..... 12.
11. Filaments less than 20 $\mu$ diam ..... 14.
12. Sheath punctate; filaments 18–26 $\mu$ diam ..... 19. *S. punctatum.*
12. Sheath not punctate ..... 13.
13. Filaments straight or arcuate, 18–22 $\mu$ diam ..... 9. *S. ocellatum majus.*
13. Filaments more or less spirally twisted, 15–20 $\mu$ diam ..... 16. *S. spirulinoides.*
14. Filaments 15–19 $\mu$ diam.; trichomes 12–14 $\mu$ diam. 10. *S. ocellatum constrictum.*
14. Filaments 15 $\mu$ or less diam ..... 15.
15. Filaments up to 12.5 $\mu$ diam ..... 16.

15. Filaments up to 15 μ diam. ..... 17.
16. Filaments 7–12 μ diam.; trichomes 5–10 μ diam. ..... 4. *S. Hofmanni.*
16. Filaments 9.5–12.5 μ diam.; trichomes 7–9 μ diam. 13. *S. javanicum pallidum.*
17. Filaments 12–15 μ diam.; trichomes 9–12 μ diam.; protoplast dark greenish to violet ..... 12. *S. javanicum.*
17. Filaments 13.8–15 μ diam.; much contorted .... 14. *S. javanicum distortum.*
18. Protoplast purplish ..... 19.
18. Protoplast not purplish ..... 20.
19. Filaments 14–18 μ diam. ..... 8. *S. ocellatum purpureum.*
19. Filaments 24–32 μ diam. ..... 20. *S. magnum.*
20. Filaments up to 24 μ diam. ..... 21.
20. Filaments up to 18 μ diam. ..... 22.
21. Filaments 19–24 μ diam.; trichomes 3.5–4 μ diam. ..... 2. *S. amplum.*
21. Filaments 15–21 μ diam.; trichomes 10–16 μ diam. ..... 17. *S. guyanense.*
21. Filaments 15–20 μ diam.; trichomes 9–13 μ diam. 17a. *S. guyanense epiphyllum.*
22. Trichomes up to 14 μ diam. ..... 25.
22. Trichomes up to 11 μ diam. ..... 24.
23. Filaments 12–18 μ diam.; trichomes 6–7 μ, up to 13 μ, diam. at the apices; cells 2–4 times as long in the older parts of the trichomes. 18. *S. guyanense minus.*
23. Filaments 10–18 μ diam.; trichomes 6–14 μ diam.; cells quadrate or less ..... 7. *S. ocellatum.*
24. Filaments 10–15 μ diam.; trichomes 5–10 μ diam.; cells 2.3–5 times as long ..... 5. *S. pulchellum.*
24. Filaments 15–18 μ diam.; trichomes 9–11 μ diam.; cells up to 35 μ long ..... 11. *S. longiarticulatum.*
25. Sheath not ocreate ..... 26.
25. Sheath more or less ocreate ..... 27.
26. Filaments 34–42 μ diam.; trichomes up to 25 μ diam. .. 30. *S. variabile.*
26. Filaments 15–20 μ diam.; trichomes 6–8 μ diam.; sheath more or less gelatinous ..... 31. *S. crustaceum.*
27. Sheath subgelatinous or mucilaginous ..... 28.
27. Sheath firm, not gelatinous ..... 29.
28. Filaments 18–26 μ diam.; trichomes moniliform, subgelatinous. 27. *S. catenulum.*
28. Filaments 12–30 μ diam.; trichomes 9–15 μ diam.; cells dolioform at the apices of the trichomes ..... 32. *S. velutinum.*
29. Filaments up to 21 μ diam. ..... 30.
29. Filaments over 21 μ diam. ..... 31.
30. Filaments 15–21 μ diam.; trichomes 6–12 μ diam. ..... 24. *S. mirabile.*
30. Filaments 9.5–13 μ diam.; trichomes 7–9 μ diam. at the apices, diminishing to 3 μ diam. in older parts ..... 28. *S. multiramosum.*
31. Filaments 450–600 μ long, 25–32 μ, up to 40 μ, diam.; trichomes 10–14 μ diam., clavate ..... 29. *S. evanescens.*
31. Filaments 1–2 mm. long, 22–28 μ diam.; trichomes 9–14 μ diam. 25. *S. mirabile majus.*
31. Filaments 2–15 mm. long; 18–36 μ diam.; trichomes 6–12 μ diam. 26. *S. Myochrous.*
32. Filaments 28–34 μ thick; sheaths with parallel lamellae 34. *S. Boergesenii.*
32. Filaments 12–24 μ thick; sheaths homgeneous ..... 33. *S. polycystum.*

1. **Scytonema tenuissimum** Schmidle, Flora, **84:** 323. 1897.

On the earth near Maricao, *1037a;* on sandstone between Hatillo and Arecibo, *1367;* on the earth at Hato Arriba, Arecibo, *1440;* on sandstone and on the earth between Hato Arriba and Arecibo, *1443c, 1444, 1448;* on the earth at Utuado, *1495, 1501;* on rocks about ten kilometers north of Utuado, *1548b.* Type locality, "Papuasiae."

2. **Scytonema amplum** W. and G. S. West, Jour. Linn. Soc. **30:** 270, *pl. 16, f. 14–16.* 1895.

La Chiquita near Maricao, *1143.* Type locality, summit of Trois Pitons, Dominica.

3. **Scytonema tenue** Gardner, Mem. N. Y. Bot. Gard. **7:** 78, *pl. 17, f. 36.* 1927.

On rocks by a reservoir, Rio Piedras, *106;* on a water drain near a stream; Maricao, *1150, 1152a.* Type locality, Rio Piedras.

4. **Scytonema Hofmanni** Ag. Syn. Alg. 117. 1817.

On a wall by the road, Santurce, *1;* on rocks by the reservoir, Rio Piedras, *107, 108a;* on rocks, walls, bark and in the water, Coamo Springs, *270, 290, 312, 368, 406b, 1919;* on the stems of bamboo, Caguas, *437;* on stone west of Humacao, *572;* on the wall of a bridge at San Martin, Fajardo, *726;* on stones near Hacienda Catalina, Palmer, *791;* on rocks, Laguna Tortuguero, *855;* on the bark of trees and on serpentine rock north of Sabana Grande, *941, 945;* on shaded earth near the "Campo," Maricao, *1229b;* on rocks and on earth near Maricao, *1252, 1280;* on earth and on sandstone between Hatillo and Arecibo, *1366, 1381, 1383, 1397, 1443b;* on rocks near Arroyo de los Corchos, *1718b;* on sandstone near Guanica, *1832;* on rocks about seven kilometers east of Coamo, *1881;* on bark in a ravine near Coamo, *1896a;* on the ground, Cayo Muertos, *Britton, Cowell and Brown, 5083;* on shaded limestone, Punta Peñones, Montalva, *Britton, Cowell and Brown, 4847.* Type locality, "Jäder Westmanniae."

5. **Scytonema pulchellum** Gardner, Mem. N. Y. Bot. Gard. **7:** 76, *pl. 16, f. 33.* 1927.

On rocks near Utuado, *1494, 1574b;* on earth near Utuado, *1501a;* with moss in the shade about three kilometers north of Utuado, *1605;* on rocks by a brook west of Humacao, *592;* on rocks and on red earth by the road, Hacienda Catalina, Palmer, *775, 777, 779, 781, 789, 790;* on rocks near Laguna Tortuguero, *852a, 854;* on red earth on the road to Monte Montoso, Maricao, *1068.* Type locality, near Utuado.

6. **Scytonema subgelatinosum** Gardner, Mem. N. Y. Bot. Gard. **7:** 74, *pl. 15, f. 29.* 1927.

On rocks near a reservoir in Rio Piedras, *108;* on rocks at the Experiment Station, Rio Piedras, *174;* on rocks by the road to Monte Montoso, Maricao, *1066;* on earth by the road north of Maricao, *1246.* Type locality, Rio Piedras.

7. **Scytonema ocellatum** (Dillw.) Lyngb. Hydr. Dan. 97, *pl. 33.* 1819.

*Conferva ocellata* Dillw. Brit. Conferv. Introd. 60, and Suppl. *pl. D.*

In a reservoir at Rio Piedras, *118;* on the outside of the wall of the reservoir west of the Experiment Station, Rio Piedras, *214;* in a stream about five kilometers east of Coamo, *237e;* on serpentine rock north of Sabana Grande, *933;* on the garden wall, Hotel Paris, Mayaguez, *991;* on rocks with moss at the "Campo," Maricao, *1238;* on the earth at Laguna Joyuda, Mayaguez, *1297;* in depressions in the limestone between Hatillo and Arecibo, *1386;* on old bark at Hato Arriba, Arecibo, *1439;* on bark at Utuado, *1506;* on leaves on the limestone at Guanica, *1847;* on rocks about seven kilometers east of Coamo, *1863;* on rocks and on bark in a ravine near Coamo Springs, *1901, 1922.* Type locality, near Southampton, England.

8. **Scytonema ocellatum purpureum** Gardner, Mem. N. Y. Bot. Gard. **7:** 79. 1927.

On soil, Coamo Springs, *292c;* on soil near a waterfall about twelve kilometers north of Ponce, *1686.* Type locality, Coamo Springs.

9. **Scytonema ocellatum majus** Gardner, Mem. N. Y. Bot. Gard. **7**: 79. 1927.

On limestone at the Hacienda, Laguna Tortuguero, *867;* on rocks by a stream near Maricao, *1157;* Cayo Muertos, *Britton, Cowell and Brown, 5082.* Type locality, Laguna Tortuguero.

10. **Scytonema ocellatum constrictum** Gardner, Mem. N. Y. Bot. Gard. **7**: 79. 1927.

On rocks by the road north of Maricao, *1253.* Type locality, near Maricao.

11. **Scytonema longiarticulatum** Gardner, Mem. N. Y. Bot. Gard. **7**: 73, *pl. 15, f. 28.* 1927.

On shaded earth near the "Campo," Maricao, *1229a;* on rocks at Jayuya, *1768.* Type locality, Maricao.

12. **Scytonema javanicum** (Kuetz.) Born.; Born. & Thuret, Not. Alg. 148. 1880.

*Symphyosiphon javanicus* Kuetz. Sp. Alg. 323. 1849.

On a wooden house and on trunks of palms, Santurce, *4, 23a, 27;* on bark of trees near the harbor, San Juan, *59;* on the wall of the tramway station, Rio Piedras, *81;* on rocks near the Experiment Station, Rio Piedras *174;* on bark and on rocks near Coamo Springs, *281, 358;* on walls, Caguas, *438, 460, 461;* on water plants in the river, Caguas, *465;* on earth on the bank of the Turabo River, *488;* on rocks on the road to San Lorenzo, *496;* on rocks, earth and bark, near Humacao, *566, 567, 631;* on rocks in the stream, Fajardo, *683, 687, 690, 692, 694;* on old wood near Hacienda Catalina, Palmer, *747;* on bark by the Hacienda, Laguna Tortuguero, *864;* on serpentine rock, Mayaguez, *896;* on lava, serpentine rock and a church wall, near Sabana Grande, *921, 923, 926a, 932, 934, 937, 938, 946, 961;* on a wall and on bark, Experiment Station, Mayaguez, *964, 977;* on the garden wall, Hotel Paris, Mayaguez, *986;* on rocks near and on a house wall in Maricao, *1042, 1045, 1046, 1048, 1274;* on trees, earth, and wood on the road near Maricao, *1086, 1100, 1165;* on earth, rocks, and bark near Mayaguez, *1182, 1303, 1331;* on limestone and earth between Hato Arriba and Arecibo, *1442, 1452, 1471;* on rocks and palms near Utuado, *1569, 1628, 1658a;* on shaded earth near Coral Vicho, near Ponce, *1682;* near a waterfall on the road to Jayuya, *1778a;* on bark in limestone near Guanica, *1839;* Punta Aguila, *Britton, Cowell and Brown, 4695;* on Limestone hill, vicinity of Guanica, *Britton, Cowell and Brown, 4898.* Type locality, Java.

13. **Scytonema javanicum pallidum** Gardner, Mem. N. Y. Bot. Gard. **7**: 81. 1927.

On serpentine rock near Mayaguez, *899a.* Type locality, near Mayaguez.

14. **Scytonema javanicum distortum** Gardner, Mem. N. Y. Bot. Gard. **7**: 81. 1927.

On logs north of Mayaguez, *1000.* Type locality, Mayaguez.

15. **Scytonema tenellum** Gardner, Mem. N. Y. Bot. Gard. **7**: 80, *pl. 18, f. 38.* 1927.

On lava rock north of Sabana Grande, *936a:* Type locality, near Sabana Grande.

16. **Scytonema spirulinoides** Gardner, Mem. N. Y. Bot. Gard. **7**: 80, *pl. 18, f. 37.* 1927.

On rocks along the road to San Lorenzo, *534.* Type locality, near San Lorenzo.

17. **Scytonema guyanense** (Mont.) Born. & Flah. Ann. Sci. Nat. Bot. VII, **5**: 94. 1887.

*Symphyosiphon guyanensis* Mont. Ann. Sci. Nat. Bot. IV. **12**: 171. 1859.

On a wall by the shore road under the Governor's Palace, San Juan, *58*, *60;* on moss on the earth by the reservoir west of the Experiment Station, Rio Piedras, *212;* on old wood at the Hotel Paris, Mayaguez, *589;* on rocks, bark, and earth in and near Maricao, *1095*, *1130*, *1147*, *1158*, *1230*, *1273;* on limestone on the road between Arecibo and Utuado, *1469*, *1475;* on serpentine rock at Utuado, *1503;* on rocks about ten kilometers north of Utuado, *1526*, *1545*, *1557*, *1559;* on the earth between Utuado and Adjuntas, *1662;* on rocks and on bark north of Ponce, *1681c*, *1812;* on rocks in Jayuya, *1771;* on rocks in the stream about five kilometers east of Coamo, *1875;* on rocks in a ravine near Coamo Springs, *1898b*. Type locality, Cayenne, French Guiana.

17a. **Scytonema guyanense epiphyllum** var. nov. Plate 2, fig. 12.

Filaments prostrate, creeping, single or associated into small groups; main filaments 15–20 μ diam., young ramuli of less width; sheath yellowish brown, lamellose in the older parts, the lamellae parallel; trichomes 9–13 μ diam.; cells variable in shape, in part cylindrical and quadrate, in part shorter and slightly dolioform; heterocysts mostly the same shape as the contiguous cells and frequently only a few cells from the apices.

Growing on the leaves of *Renealmia* sp., Las Marias, July 10, 1915, *F. L. Stevens*, *1175*. The type.

The outstanding distinguishing feature of this variety of *S. guyanense* is its habitat and habit of growth. It does not form cushions of densely compact layers of erect filaments as is usually the case. On the contrary, it creeps close to the substratum and apparently its branches are prostrate and parallel with the same. There is more variation in the cell and in the sheath characters than is ordinarily represented in *S. guyanense*.

18. **Scytonema guyanense minus** Gardner, Mem. N. Y. Bot. Gard. **7**: 79. 1927.

On lava between Arecibo and Utuado, *1455*. Type locality, near Utuado.

19. **Scytonema punctatum** Gardner, Mem. N. Y. Bot. Gard. **7**: 75, *pl. 16, f. 32*. 1927.

On rocks between Utuado and Adjuntas, *1658*. Type locality, near Utuado.

20. **Scytonema magnum** Gardner, Mem. N. Y. Bot. Gard. **7**: 75, *pl. 16, f. 31*. 1927.

On rocks in a brook about five kilometers north of Utuado, *1609;* on rocks between Utuado and Adjuntas, *1661*. Type locality, near Utuado.

21. **Scytonema capitatum** Gardner, Mem. N. Y. Bot. Gard. **7**: 72, *pl. 15, f. 27*. 1927.

On rocks about ten kilometers north of Utuado, *1537a*. Type locality, near Utuado.

22. **Scytonema lyngbyoides** Gardner, Mem. N. Y. Bot. Gard. **7**: 78, *pl. 17, f. 35*. 1927.

On rocks in a brook about five kilometers north of Utuado, *1607;* on rocks between Utuado and Adjuntas, *1646;* Cayo Muertos, *Britton, Cowell and Brown*, *5084*. Type locality, near Utuado.

23. **Scytonema Milleri majus** Gardner, Mem. N. Y. Bot. Gard. **7**: 76. 1927.

On rocks by a stream near Maricao, *1166*. Type locality, near Maricao.

24. **Scytonema mirabile** (Dillw.) Born. Bull. Sci. Bot. Fr. **36:** 12. 1889.

*Conferva mirabilis* Dillw. Brit. Conferv. *pl. 96.* 1808.

On trunks of palms in the Park, Santurce, *21, 29;* on the wall below the Governor's palace, San Juan, *63;* on rocks on the way to San Lorenzo, *525a;* on stone west of Humacao, *577;* in Laguna Tortuguero, *836;* on serpentine rock near Mayaguez, *899b;* on the earth north of Sabana Grande, *930a;* on bark by the road to Monte Montoso, Maricao, *1087, 1088;* on limestone in the mountains between Cabo Rojo and San German, *1193;* on limestone between Arecibo and Utuado, *1476e;* on rocks about ten kilometers north of Utuado, *1548a, 1552, 1567;* on rocks and in a waterfall in and near Jayuya, *1771, 1778;* on rocks in a ravine near Coamo Springs, *1906 I and II;* on blocks of lava near Coamo Springs, *1916b.* Type locality, Penllergare, near Swansea, Great Britain.

25. **Scytonema mirabile majus** Gardner, Mem. N. Y. Bot. Gard. **7:** 78. 1927.

On rocks about ten kilometers north of Utuado, *1563;* on damp rocks about five kilometers north of Utuado. *1617.* Type locality, near Utuado.

26. **Scytonema Myochrous** (Dillw.) Ag. Disp. Alg. Suec. 38. 1812.

*Conferva Myochrous* Dillw. Brit. Conferv. 131, *pl. 19.* 1802. Type locality, England.

On the shore of Laguna Tortuguero, *844, 849b;* La Chiquita, near Maricao, *1144.* Type locality, "In Alpine torrents, Beddgelert, and the lower regions of Snowdon." Dillw.

27. **Scytonema catenulum** Gardner, Mem. N. Y. Bot. Gard. **7:** 77, *pl. 17, f. 34.* 1927.

On rocks and on earth about ten kilometers north of Utuado, *1556, 1561, 1565;* on rocks between Utuado and Adjuntas, *1643.* Type locality, near Utuado.

28. **Scytonema multiramosum** Gardner, Mem. N. Y. Bot. Gard. **7:** 81, *pl. 18, f. 39.* 1927.

On shaded rocks about ten kilometers north of Utuado, *1527.* Type locality, near Utuado.

29. **Scytonema evanescens** Gardner, Mem. N. Y. Bot. Gard. **7:** 71, *pl. 15, f. 26.* 1927.

On limestone at Hato Arriba, Arecibo, *1397g, 1430;* on limestone between Arecibo and Utuado, *1481, 1482.* Type locality, near Arecibo.

30. **Scytonema variabile** Gardner, Mem. N. Y. Bot. Gard. **7:** 74, *pl. 15, f. 30.* 1927.

With moss on a water pipe near a stream, Maricao, *1149a, 1153.* Type locality, Maricao.

31. **Scytonema crustaceum** Ag. Syst. Alg. 39. 1824.

On shaded earth, Coamo Springs, *296;* on limestone between Arecibo and Utuado, *1476d;* on rocks about ten kilometers north of Utuado, *1542* (?). Type locality, near Stockholm.

32. **Scytonema velutinum** Kuetz. Actien, 1836.

On limestone at Hato Arriba near Arecibo, *1406.* Type locality, Abano Baths, Italy.

33. **Scytonema polycystum** Born. & Flah. Ann. Sci. Nat. Bot. VII, **5:** 90. 1887.

Growing on *Corallina* sp., dredged in 7 meters depth off Guanica Harbor, *Howe, 7422.*

This collection adds another locality for this seeming rare though amply distinct species of marine *Scytonema* and shows its wide distribution. The type locality is on the coast of New Caledonia. It was collected in the East Indies by the Siboga Expedition, and was reported by W. A. Setchell (Univ. Calif. Publ. Bot. **12**: 67. 1926) from Arue Reef, Tahiti.

34. **Scytonema Boergesenii** sp. nov.

Filaments 28–34 μ diam., densely intertwined, tortuous, forming dark-brown mats 2–3 mm. thick, almost black on drying; sheath thick, composed of several parallel lamellae at maturity, light to dark yellowish brown, occasionally slightly ochreate; trichome bright aeruginous, 16–22 μ diam., slightly to decidedly torulose in the apical region, tapering to one half the apical diameter in the older parts except in secondary meristematic regions; cells one third to one half the diameter in meristematic regions, mostly quadrate in the older parts; heterocysts more or less quadrate to 2.5 times as long as the diameter; branching sparse in the material at hand.

Cambsy, St. Croix, *Boergesen;* Coral Bay, St. Jan, *Boergesen, 131*, September, 1905, the type.

Very few species of *Scytonema* are known to inhabit salt water. The size and other characters of the trichomes, the thickness, color, and laminated character of the sheath, make this species amply distinct from all other known species of like habitat.

35. **Scytonema** sp.

Growing on leaves. Dos Bocas, *F. L. Stevens, 1054.*

This species of *Scytonema* is rather remarkable in the possession of numerous apparently overlapping characters. The material seems to have been in active, growing condition when collected. Good examples of both single and geminate branching were observed, although neither kind is abundant. The filaments vary from 15 μ to 30 μ and the trichomes from 12 μ to 20 μ in diameter. The sheath is hyaline, homogeneous, and narrow and close-fitting at the apices. Cells vary from one third to one and a half times as long as the diameter, are pale-aeruginous, and nearly homogeneous, cylindrical. Heterocysts vary from quadrate to very much compressed-spherical or constricted at the cross walls.

Some characters seemingly will have to be waived in order that it may be placed with any known species. The material is sparse. It is probably most closely related to *S. guyanense epiphyllum* Gardner.

40. **HASSALLIA** Berk.; Hassall, Hist. Brit. Alg. **1**: 231. 1845.

Type species, *Hassallia ocellata* (*Stigonema ocellatum* Thur.).

1. Sheath more or less ocreate and in part lamellose ..... 2.
1. Sheath neither lamellose nor ocreate ..... 3.
   2. Filaments 10–15 μ diam.; trichomes 9–11 μ diam.; sheath subocreate ..... 3. *H. byssoidea.*
   2. Filaments 18–24 μ diam.; trichomes 15–19 μ diam.; sheath lamellose and ocreate in part ..... 7. *H. scytonematoides.*
3. Trichomes not constricted, branching both single and geminate. 5. *H. heterogenea.*
3. Trichomes more or less constricted at the cross walls, or dolioform ..... 4.
   4. Filaments 8.5–10.5 μ diam.; trichomes 7.2–8.4 μ diam.; cells dolioform throughout the filament ..... 2. *H. brevis.*
   4. Filaments 22–25 μ diam.; trichomes 17–20 μ diam.; cells discoid, 4–6 μ long ..... 6. *H. discoidea.*
   4. Trichomes constricted at the cross walls ..... 5.
5. Filaments short and rigid, 5.5–7 μ diam.; trichomes 4–5.5 μ diam. 1. *H. fragilis.*

5. Filaments longer, over 8 μ diam. ..... 6.
   6. Filaments 11–13.5 μ diam.; trichomes 10–12 μ diam.; cells densely granular ..... 4. *H. granulata.*
   6. Filaments 14.5–17.5 μ diam.; trichomes 6–7 μ diam.; sheath granular and rough ..... 8. *H. rugulosa.*

1. **Hassallia fragilis** Gardner, Mem. N. Y. Bot. Gard. **7:** 85, *pl. 20, f. 46.* 1927.

On old wood at Hacienda Catalina, Palmer, *747c;* on a jar near Laguna Joyuda, Mayaguez, *1306;* on the bark of trees in a ravine near Coamo Springs, *1896b;* on shaded rocks about seven kilometers east of Coamo, *1869a.* Type locality, Palmer.

2. **Hassallia brevis** Gardner, Mem. N. Y. Bot. Gard. **7:** 82, *pl. 18, f. 40.* 1927.

On the bark of trees, Coamo Springs, *300c;* on a cement fountain in Fajardo, *659;* on old wood at Hacienda Catalina, Palmer, *747;* on bark at the Hacienda, Laguna Tortuguero, *864;* on shaded rocks about seven kilometers east of Coamo, *1869b, 1870.* Type locality, Fajardo.

3. **Hassallia byssoidea** Hassall, Hist. Brit. Alg. **1:** 233. 1845.

A specimen in the herbarium of The New York Botanical Garden, collected by Howe on bark of *Lonicera japonica* (?) at Santurce, appears to represent the forma *lignicola* Born. & Fl. Type locality, Oundle, Northamptonshire, England.

4. **Hassallia granulata** Gardner, Mem. N. Y. Bot. Gard. **7:** 82, *pl. 18, f. 41.* 1927.

On bark along the road near Coamo Springs, *1913.* Type locality, near Coamo Springs.

5. **Hassallia heterogenea** Gardner, Mem. N. Y. Bot. Gard. **7:** 83, *pl. 19, f. 42.* 1927.

On rocks at Hacienda Holm, Mayaguez, *1191;* on rocks near Laguna Joyuda, Mayaguez, *1307;* on a block wall and on lava blocks, Coamo Springs, *1921, 1923a.* Type locality, Mayaguez.

6. **Hassallia discoidea** Gardner, Mem. N. Y. Bot. Gard. **7:** 83, *pl. 19, f. 43.* 1927.

On shaded rocks about seven kilometers east of Coamo, *1870.* Type locality, Coamo.

7. **Hassallia scytonematoides** Gardner, Mem. N. Y. Bot. Gard. **7:** 84, *pl. 19, f. 44.* 1927.

On bark along the road to Monte Montoso, Maricao, *1087a.* Type locality, near Maricao.

8. **Hassallia rugulosa** Gardner, Mem. N. Y. Bot. Gard. **7:** 84, *pl. 19, f. 45.* 1927.

On rocks by the road to San Lorenzo, *517.* Type locality, near San Lorenzo.

### 41. **TOLYPOTHRIX** Kuetz. Phyc. Gen. 227. 1843.

Type species, *Tolypothrix muscicola.*

1. Sheath always hyaline ..... 2.
1. Sheath hyaline, changing to yellowish or brownish ..... 4.
   2. Filaments 18 μ diam.; trichomes 12–14 μ diam.; heterocysts up to 50 μ long, cylindrical ..... 5. *T. penicillata brevis.*
   2. Filaments less than 18 μ diam ..... 3.

3. Filaments 7–8.5 μ diam.; trichomes not constricted except slightly at the apices.....1. *T. Willei.*
3. Filaments 6–7 μ diam.; trichomes constricted at the cross walls. 2. *T. papyracea.*
4. Filaments less than 20 μ diam.....5.
4. Filaments more than 20 μ diam.....6.
5. Filaments 8–10 μ diam.; trichomes 6–8 μ diam.....3. *T. tenuis.*
5. Filaments 9–12.5 μ diam.; trichomes 10 μ long.....4. *T. lanata.*
6. Sheath homogeneous at maturity; filaments 22–26 μ diam.; trichomes 16–18 μ diam.; cells 3–6 μ long.....7. *T. amoena*
6. Sheath lamellose at maturity; filaments 22–30 μ diam.; trichomes 12–18 μ diam.; cells 2–4 μ long.....6. *T. robusta.*

1. **Tolypothrix Willei** Gardner, Mem. N. Y. Bot. Gard. **7:** 87, *pl. 20, f. 50.* 1927.

In a reservoir west of the Experiment Station, Rio Piedras, *209a;* in a ditch between Utuado and Adjuntas, *1649a.* Type locality, near Rio Piedras.

2. **Tolypothrix papyracea** Gardner, Mem. N. Y. Bot. Gard. **7:** 85, *pl. 20, f. 47.* 1927.

Collected near Manati, Porto Rico, by *Dr. W. C. Earle.* Type locality, Porto Rico.

3. **Tolypothrix tenuis** Kuetz. Phyc. Gen. 228. 1843.

On rocks between Utuado and Adjuntas, *1639a.* Type locality, Schleusingen.

4. **Tolypothrix lanata** (Desv.) Watermann; Rabenhorst, Algen, no. 768. 1858.

*Trichophorus lanatus* Desv. Jour. de Bot. **2:** 309. 1809.

In Laguna Tortuguero, *829a.* Type locality, Haut-Poitou, France.

5. **Tolypothrix penicillata brevis** Gardner, Mem. N. Y. Bot. Gard. **7:** 85. 1927.

In a reservoir at Rio Piedras, *111, 115, 118, 119a;* on the margin of Laguna Tortuguero, *843.* Type locality, Rio Piedras.

6. **Tolypothrix robusta** Gardner, Mem. N. Y. Bot. Gard. **7:** 87, *pl. 20, f. 49.* 1927.

In association with other algae in Laguna Tortuguero, *826, 827.* Type locality, Laguna Tortuguero.

7. **Tolypothrix amoena** Gardner, Mem. N. Y. Bot. Gard. **7:** 86, *pl. 20, f. 48.* 1927.

In a water basin west of the Experiment Station, Rio Piedras, *1932, 1935, 1936, 1941, 1943, 1945, 1952;* in a stream about five kilometers east of Coamo, *221c.* Type locality, near Rio Piedras.

## FAMILY 6. **RIVULARIACEAE**

1. Plants propagating by gonidia at their bases, heterocysts and branching absent.....42. *Leptochaete.*
1. Plants propagating by hormogonia or in part by resting spores.....2.
2. Plants separate, usually attached at the base or more or less intertwined, forming a dense stratum, single within a sheath. 43. *Calothrix.*
2. Plants either forming definite, more or less gelatinous, colonies, or extending into indefinite strata.....3.
3. Plants associated into definite colonies; trichomes single within a sheath.....45. *Rivularia.*

3. Plants usually forming indefinite colonies; trichomes plural within a sheath ..... 44. *Dichothrix.*

42. **LEPTOCHAETE** Borzi, Nuovo Giorn. Bot. Ital. **14:** 298. 1882.

Type species, *Leptochaete crustacea.*

1. **Leptochaete tenella** Gardner, Mem. N. Y. Bot. Gard. **7:** 65, *pl. 12, f. 17.* 1927.

On stones in a stream near Maricao, *1128.* Type locality, near Maricao.

43. **CALOTHRIX** Ag. Syst. Alg. xxv. 1824.

Type species *Calothrix confervicola* based on *Conferva confervicola* Roth.

1. Plants growing in fresh water ..... 2.
1. Plants marine ..... 12.
2. Plants forming resting spores at the base, 1–3-seriate, 8–9.5 μ diam., 12–16 μ long; heterocysts single, basal ..... 7. *C. simulans.*
2. Plants not forming resting spores ..... 3.
3. Sheath yellow, repeatedly ocreate; heterocysts basal, sometimes intercalary, plants up to 1 mm. high ..... 5. *C. parietina.*
3. Sheath hyaline; heterocysts all basal ..... 4.
4. Trichomes almost cylindrical throughout their entire length ..... 5.
4. Trichomes tapering more or less definitely ..... 6.
5. Filament about 125 μ long, 6.8–7.5 μ at the base; trichomes 4.8–5.6 μ diam. at the base, conical at the apex ..... 1. *C. conica.*
5. Filaments 350–500 μ, rarely 1 mm. long; trichomes 5–7 μ diam., a few cells slightly wider at the base and narrower in the apical region ..... 3. *C. intermedia.*
6. Sheath ocreate; filaments 8–10.8 μ diam. at the base; trichomes 5–6 μ at the base, tapering to a hair, 1.4 μ diam. 10. *C. Braunii mollis.*
6. Sheath not ocreate ..... 7.
7. Filaments 400 μ or more long ..... 8.
7. Filaments 400 μ or less long ..... 10.
8. Filaments 700–900 μ long, 12–14 μ diam.; trichomes 9.5–11.5 μ diam ..... 11. *C. Juliana tenuior.*
8. Trichomes 6–7.5 μ diam ..... 9.
9. Trichomes straight, up to 500 μ long ..... 8. *C. Braunii.*
9. Trichomes much contorted, up to 800 μ long ..... 9. *C. Braunii contorta.*
9. Trichomes up to 700 μ long, torulose at the base ..... 6. *C. parietina torulosa.*
10. Filaments 100 μ long or less; trichomes 4–6.2 μ diam ..... 2. *C. tenella.*
10. Filaments 200 μ or more diam ..... 11.
11. Filaments 18 μ diam. at the base; trichomes 10–14 μ diam ..... 12. *C. simplex.*
11. Filaments 7–8 μ diam. at the base; trichomes 5.5–6.8 μ diam ..... 4. *C. evanescens.*
12. Heterocysts basal only ..... 13.
12. Heterocysts basal and intercalary ..... 15.
13. Plants solitary or at most only a few aggregated ..... 13. *C. epiphytica.*
13. Plants forming tufts or caespitose layers ..... 14.
14. Filaments 9–15 μ diam., trichomes 6–8 μ diam ..... 15. *C. Contarenii.*
14. Filaments 10–18 μ diam., trichomes 9–12 μ diam ..... 19. *C. scopulorum.*
14. Filaments 15–18 μ diam., trichomes 8–12 μ diam ..... 14. *C. pulvinata.*
15. Plants usually epiphytic ..... 16. *C. aeruginea.*
15. Plants growing in other habitats ..... 16.
16. Filaments unbranched for the most part, usually attached at the base ..... 17. *C. crustacea* var.
16. Filaments usually branching freely, attached on one side and one or both ends erect ..... 18. *C. pilosa.*

1. **Calothrix conica** Gardner, Mem. N. Y. Bot. Gard. **7:** 66, *pl. 13, f. 18.* 1927.

On trees in a ravine, Coamo Springs, *1895.* Type locality, Coamo Springs.

2. **Calothrix tenella** Gardner, Mem. N. Y. Bot. Gard. **7:** 67, *pl. 13, f. 20.* 1927.

On rocks near Maricao, *1036a.* Type locality, near Maricao.

3. **Calothrix intermedia** nom. nov. *C. linearis* Gardner, Mem. N. Y. Bot. Gard. **7:** 68, *pl. 13, f. 21.* 1927. (Not *C. linearis* Gardner, Rhodora, **28:** 23, 1926, but very closely related.)

On a wall near a bridge, Caguas, *461c;* on a water pump in the town of Maricao, *1276a.* Type locality, Maricao.

4. **Calothrix evanescens** Gardner, Mem. N. Y. Bot. Gard. **7:** 69, *pl. 13, f. 22.* 1927.

On a wall at the entrance to the baths, Coamo Springs, *411;* in water near Jayuya, *1776a.* Type locality, Jayuya.

5. **Calothrix parietina** (Naeg.) Thur. Ann. Sci. Nat. Bot. VI, **1:** 381. 1875.

*Schizosiphon parietinus* Naeg.; Kuetz. Sp. Alg. 327. 1849.

On the rocks near Coral Vicho, twelve kilometers north of Ponce, *1683;* on the rocks, Arroyo de los Corchos, *1731c;* on bark in a ravine near Coamo, *1895 III.* Type locality, Zürich.

6. **Calothrix parietina torulosa** Gardner, Mem. N. Y. Bot. Gard. **7:** 67, 1927.

In the Rio Grande near Sabana Grande, *914.* Type locality, Sabana Grande.

7. **Calothrix simulans** Gardner, Mem. N. Y. Bot. Gard. **7:** 70, *pl. 13, f. 23.* 1927.

In a water basin west of the Experiment Station, Rio Piedras, *1946.* Type locality, near Rio Piedras.

8. **Calothrix Braunii** Born. & Flah. Ann. Sci. Nat. Bot. VII, **3:** 368. 1886.

On the dam near the reservoir west of the Experiment Station, Rio Piedras, *168a;* in the reservoir west of the Experiment Station, Rio Piedras, *203b;* on the bark of a tree in the deep forest, Coamo Springs, *317.* Type locality Germany.

9. **Calothrix Braunii contorta** Gardner, Mem. N. Y. Bot. Gard. **7:** 67. 1927.

On a wall near a bridge, Caguas, *461a;* on the wall of a house in Maricao, *1049;* on rocks, ten kilometers north of Utuado, *1535, 1536.* Type locality, Maricao.

10. **Calothrix Braunii mollis** Gardner, Mem. N. Y. Bot. Gard. **7:** 68. 1927.

On the earth near Maricao, *1037b.* Type locality, Maricao.

11. **Calothrix Juliana tenuior** Gardner, Mem. N. Y. Bot. Gard. **7:** 69. 1927.

On twigs in a stream north of Maricao, *1291;* on the roots of water plants, Arroyo de los Corchos, *1696.* Type locality, Arroyo de los Corchos.

12. **Calothrix simplex** Gardner, Mem. N. Y. Bot. Gard. **7:** 66, *pl. 14, f. 19.* 1927.

On stones in the Turabo River, Caguas, *481;* in a brook near the road, San Lorenzo, *501;* in a pool about four kilometers north of Mayaguez, *1327c;* on the banks of Laguna Guanica, *1815.* Type locality, San Lorenzo.

13. **Calothrix epiphytica** W. and G. S. West, Jour. Bot. **35:** 240. 1897.

There are a few specimens of a small *Calothrix* growing attached to *Centroceras clavulatum* (*Howe no. 2112a*) which, in size and habit of growth, approximates

*Calothrix epiphytica* W. & G. S. West, an epiphytic fresh water species. The same species was reported, with doubts, by Setchell and Gardner (Univ. Calif. Publ. Bot. **8:** 99. 1919) as occurring sparsely on *Rhizoclonium* in brackish water. Howe's specimen is strictly an oceanic form. More material and study will be required to establish the identity of the species with certainty.

Type locality: Massamodes, Africa.

14. **Calothrix pulvinata** (Mert.) Ag. Syst. Alg. 71. 1824.

*Ceramium pulvinatum* Mertens *in* Jürgens, Alg. Aquat., Dec. 4, no. 5, 1817.

Near low water mark, Guanica Harbor, *Howe, 6921.* Type locality, North Sea.

This species of *Calothrix* has previously been reported only from the northern colder waters as far as the writer is aware, and it is considerably doubtful whether the name should be assigned to this material. The material is very sparse—only a single epiphytic tuft, less than a millimeter high. Heterocysts usually two, and basal; base of filament slightly swollen; filaments about 18 $\mu$ diam.; sheath slightly lamellose; trichome about 13 $\mu$ diam. The species grows in a great variety of habitats.

15. **Calothrix Contarenii** (Zanard.) Born. & Flah. Ann. Sci. Nat. Bot. VII, **3:** 344. 1886.

*Rivularia Contarenii* Zanardini, Bibl. Ital. **96:** 134. 1839.

Epiphytic on *Galaxaura.* Santurce, San Juan, *Howe, 1858.* Type locality, Italian shores, Adriatic Sea.

The material of this collection, if not *C. Contarenii,* seems at least to be a very close affinity of it. The epiphytic habitat is unusual for *C. Contarenii.*

16. **Calothrix aeruginea** (Kuetz.) Thuret, Ann. Sci. Nat., VI, Bot., **1:** 382. 1875.

*Leibleinia aeruginea* Kuetzing, Phyc. Gen. 221. 1843.

Forming blackish-green patches on the roots of *Rhizophora,* in the littoral belt, Culabra Island, *Howe, 4277;* on *Caulerpa, Howe, 2001;* on *Penicillus, Howe, 1842.* Type locality, Trieste.

17. **Calothrix crustacea** var.

Salinas Cove, near Guanica Harbor, *Howe, 7208;* on reefs and cays, west of the mouth of Guanica Harbor, *Howe, 7281;* St. Thomas Island, *Boergesen, 1151.*

Filaments 24–28 $\mu$ diam.; sheath homogeneous, hyaline, close fitting to the apices when young, later slightly infundibulous; trichome 15–18 $\mu$ diam. heterocysts in Howe's specimens very numerous.

18. **Calothrix pilosa** Harvey, Ner. Bor.-Amer. **3:** 106, *pl. 48c.* 1858.

Growing on a sea wall at San Juan. *Howe, 2114, 2126, and 2150;* forming a thin compact coating on roots of *Rhizophora* and on rocks, Lemon Bay, near Guanica, *Howe, 2609 and 2630.* All growing in the littoral belt. The type locality is Key West, Florida.

19. **Calothrix scopulorum** (Web. & Mohr) Agardh, Syst. Alg. 70. 1824.

*Conferva scopulorum* Weber & Mohr, Reise d. Schweden, 195, *pl. 3, f. 3ab.* 1824.

Growing on other algae, St. Thomas, *Boergesen, 1143;* Cane Bay, St. Croix, *Boergesen, 1411 and 1421;* Lt. Princess, St. Croix, *Boergesen, 14.* Type locality, Sweden.

This species of *Calothrix* is ordinarily accredited to the colder waters of the Arctic and North Temperate regions. Collins has reported it from the Bermuda and from the Bahama islands, and Taylor from Florida.

The material of Boergesen's collections reported here is not typical as figured and described by Bornet and Thuret, but at least is a very close affinity of *C. scopulorum*. There is no indication of lamellate or ocreate sheaths.

### 44. **DICHOTHRIX** Zanard. Mem. R. Ist. Veneto, **7**: 297. 1858.

Type species, *Dichothrix penicillata*.

1. Filaments about 1 mm. long, 12–15 μ diam. in ultimate branches; sheath ample, gelatinous ..... 1. *D. Willei*.
1. Filaments about 2 mm. long, 25–35 μ diam. in ultimate branches. ..... 2. *D. penicillata*.
1. Filaments about 7 mm. long, 20–30 μ diam. in ultimate branches. ..... 3. *D. fucicola*.
1. Filaments about 1 cm. long, 15 μ diam. in ultimate branches ..... 4. *D. Baueriana*.

1. **Dichothrix Willei** Gardner, Mem. N. Y. Bot. Gard. **7**: 70, *pl. 14, f. 24*. 1927.

On rocks and in ditches about ten kilometers north of Utuado, *1527b*, *1539d*, *1541*, *1554*, *1555*, *1566*. Type locality, near Utuado.

2. **Dichothrix penicillata** Zanard, Mem. R. Ist. Veneto, **7**: 89, *pl. 12, f. 3*. 1858

Collected at Santurce, San Juan, *Howe, 1930 and 2160*, both collections growing on *Digenia* in pools. Type locality, Red Sea.

3. **Dichothrix fucicola** (Kuetz.) Born. & Flah. Ann. Sci. Nat. Bot. VII, **3**: 379. 1886.

*Schizosiphon fucicola* Kuetz. Bot. Zeit. **5**: 178. 1847.

Culebra Island, *Howe, 4243;* Muertos Island (Caja de Muertos), *Howe, 7151 and 7515;* St. Thomas, *Boergesen, 1098*, *1099*, *1152;* St. Croix, *Boergesen, 1466*, *1467*. Type locality, Campeche-Bank.

4. **Dichothrix Baueriana** (Grun.) Born. & Flah. Ann. Sci. Nat. Bot. VII, **3**: 375. 1886.

*Schizosiphon Baueriana* Grun. Rabenh. Fl. Eur. Alg. **2**: 238. 1865.

Santurce, San Juan, *Howe, 1842*, *2168*, *2169*, *and 2217;* Rincon, *Howe, 2499*. All growing on rocks in the littoral belt. Type locality, Plötzensee, near Berlin.

### 45. **RIVULARIA** Ag. Disp. Alg. Suec. 43. 1812.

Type species, *Rivularia atra*.

1. **Rivularia** (**Gloeotrichia**) **flagelliformis** Gardner, Mem. N. Y. Bot. Gard. **7**: 71, *pl. 14, f. 25*. 1927.

In a water reservoir near Rio Piedras, *126*. Type locality, near Rio Piedras.

## Family 7. **STIGONEMATACEAE**

1. Filaments with a thick, confluent, gelatinous sheath, forming a more or less definite colony ..... 48. *Brachytrichia*.
1. Filaments with sheaths distinct ..... 2.
2. Filaments monosiphonous, branches always unilateral ..... 47. *Hapalosiphon*.
2. Filaments polysiphonous, or in a few species monosiphonous, branches on all sides ..... 46. *Stigonema*.

### 46. **STIGONEMA** Ag. Syst. Alg. 42. 1824.

Type species *Stigonema mamillosum*, based on *Bangia mamillosa* Lyngbye.

1. Filaments monosiphonous in greater part ..... 2.
1. Filaments polysiphonous ..... 7.
2. Filaments not over 15 μ diam ..... 3.
2. Filaments 15 μ or more diam ..... 5.

3. Branches constricted at the base; sheath thin, firm; filaments 12–15 μ diam. ..... 14. *S. congestum*
3. Branches not constricted at the base ..... 4.
4. Filaments 7–15 μ diam.; cells greenish gray, sheath relatively thick ..... 1. *S. hormoides.*
4. Filaments 5.5–7 μ diam. ..... 2. *S. hormoides tenue.*
4. Filaments 7–8 μ diam.; sheath hyaline to yellowish. 6. *S. hormoides lineare.*
4. Filaments 8–9 μ diam.; sheath thin, dark brown. 4. *S. hormoides nodulosum.*
4. Filaments 8.5–10 μ diam.; sheath thin, dark brown. 5. *S. hormoides rigidum.*
4. Filaments 11–13 μ diam.; sheath hyaline. . 3. *S. hormoides constrictum.*
5. Homogoniferous branches acuminate; filaments 16–20 μ diam. . 12. *S. elegans.*
5. Filaments 14–16 μ diam.; trichomes 8.8–11 μ diam. . . . . 13. *S. elegans minus.*
5. Hormogoniferous branches blunt ..... 6.
6. Filaments 125–175 μ long, 23–27 μ diam.; cells 11–13 μ diam. 19. *S. scytonematoides.*
6. Filaments 300–400 μ long, 23–27 μ diam.; cells 17–19 μ diam. 11. *S. parciramosum.*
7. Hormogoniferous branches acuminate ..... 8.
7. Hormogoniferous branches blunt ..... 9.
8. Hormogoniferous branches perpendicular to the filament, hormogonia composed of 6–8 cells ..... 16. *S. cornutum*
8. Hormogoniferous branches standing at an angle with the filament, hormogonia composed of 15–20 cells ..... 18. *S. spiniferum.*
9. Sheath always hyaline at maturity ..... 15. *S. tuberculatum.*
9. Sheath not hyaline at maturity ..... 10.
10. Filaments 25 μ diam.; cells 7–8.5 μ diam.; sheath opalescent. 10. *S. opalescens.*
10. Sheath not opalescent ..... 11.
11. Filaments 28–32 μ diam. ..... 9. *S. minutum parciramosum.*
11. Filaments 30 μ or less diam. ..... 12.
12. Filaments 18–28 μ diam.; sheath dark yellow, lamellate. . 7. *S. minutum.*
12. Filaments 300–400 μ long, 25 μ diam. ..... 7a. *S. minutum ramentaceum.*
12. Filaments very crooked and tuberculate. . . 8. *S. minutum tuberculatum.*
12. Filaments blunt, much branched, 25–30 μ diam. . . 17. *S. ramosissimum.*

1. **Stigonema hormoides** (Kuetz.) Born. & Flah. Ann. Sci. Nat. Bot. VII, **5:** 68. 1887.

*Scytonema hormoides* Kuetz. Phyc. Gen. 215. 1843.

On rocks by the road to San Lorenzo, *496c;* on stones near Hacienda Catalina, Palmer, *791c;* on serpentine rock, Mayaguez, *890a;* on rocks at Maricao, *1041a, b;* on earth by the road north of Maricao, *1246b;* on earth near Utuado, *1622.* Type locality, "Bretagne."

2. **Stigonema hormoides tenue** W. & G. S. West, Jour. Linn. Soc. Bot. **30:** 273, *pl. 15, f. 4–8.* 1895.

In a reservoir at Rio Piedras, *112a;* on red soil near Maricao, *1025e.* Type locality, San Domingo.

3. **Stigonema hormoides constrictum** Gardner, Mem. N. Y. Bot. Gard. **7:** 87. 1927.

On damp fern roots and on earth about twenty kilometers north of Ponce, *1810.* Type locality, near Ponce.

4. **Stigonema hormoides nodulosum** Gardner, Mem. N. Y. Bot. Gard. **7:** 88. 1927.

On damp earth, Coamo Springs, *310.* Type locality, Coamo Springs.

5. **Stigonema hormoides rigidum** Gardner, Mem. N. Y. Bot. Gard. **7**: 88. 1927.

On red soil near Mayaguez, *880f*. Type locality, near Mayaguez.

6. **Stigonema hormoides lineare** Gardner, Mem. N. Y. Bot. Gard. **7**: 88. 1927.

On soil at the Experiment Station, Rio Piedras, *117a*. Type locality, Rio Piedras.

7. **Stigonema minutum** (Ag.) Hass. Hist. Brit. Freshw. Alg. 230, *pl. 67, f. 3, 4*. 1845.

*Scytonema minutum* Ag. Synopsis, 117. 1817.

On trunks of palms in the Park, Santurce, *23;* on earth near the Experiment Station, Rio Piedras, *117;* on stones near the Hacienda Catalina, Palmer, *791b;* on earth at Maricao, *1037;* on earth by the road to Monte Montoso, Maricao, *1071a;* on earth and on rocks by the road north of Maricao, *1241, 1249, 1252b, 1258, 1269, 1270;* on serpentine rock, on bark and on stones near Utuado, *1503a, 1507a, 1576;* in a stream about five kilometers east of Coamo, *1886*. Type locality not designated.

7a. **Stigonema minutum ramentaceum** Gardner, Mem. N. Y. Bot. Gard. **7**: 91. 1927.

On old wood at Laguna Tortuguero, *847, 848*. Type locality, Laguna Tortuguero.

8. **Stigonema minutum tuberculatum** Gardner, Mem. N. Y. Bot. Gard. **7**: 90. 1927.

On stone, west of Humacao, *566a, 571a*. Type locality, near Humacao.

9. **Stigonema minutum parciramosum** Gardner, Mem. N. Y. Bot. Gard. **7**: 90. 1927.

On stone, west of Humacao, *568*. Type locality, near Humacao.

10. **Stigonema opalescens** Gardner, Mem. N. Y. Bot. Gard. **7**: 93, *pl. 22, f. 58*. 1927.

On rocks near Maricao, *1033*. Type locality, near Maricao.

11. **Stigonema parciramosum** Gardner, Mem. N. Y. Bot. Gard. **7**: 93, *pl. 23, f. 59*. 1927.

On lava north of Sabana Grande, *921a*. Type locality, near Sabana Grande.

12. **Stigonema elegans** Gardner, Mem. N. Y. Bot. Gard. **7**: 88, *pl. 20, f. 51*. 1927.

On stone west of Humacao, *573, 575b;* on pieces of plants and on lava blocks in a primeval forest near Hacienda Catalina, Palmer, *768a, 769;* on rocks at Laguna Tortuguero, *852d;* on soil along the road, Maricao, *1247;* on a cliff, Utuado to Adjuntas, *Howe, Britton, and Cowell, 1241 and 1261*. Type locality, near Humacao.

13. **Stigonema elegans minus** Gardner, Mem. N. Y. Bot. Gard. **7**: 89. 1927.

On rocks by the Arroyo de los Corchos, *1715a*. Type locality, Arroyo de los Corchos.

14. **Stigonema congestum** Gardner, Mem. N. Y. Bot. Gard. **7**: 89, *pl. 21, f. 52*. 1927.

On trunks of palms in the Park, Santurce, *23;* in a stream, San Lorenzo, *503;* on stone west of Humacao, *570a, 571b;* on red earth and on stones near Hacienda Catalina, Palmer, *776, 791;* on lava blocks north of Sabana Grande, *923a, 936;* on red earth on the road north of Maricao, *1241;* in a stream about five kilometers east of Coamo, *1886e.* Type locality, Hacienda Catalina, Palmer.

15. **Stigonema tuberculatum** Gardner, Mem. N. Y. Bot. Gard. **7:** 93, *pl. 21, f. 55.* 1927.

On rocks near Maricao, *1030.* Type locality, near Maricao.

16. **Stigonema cornutum** Gardner, Mem. N. Y. Bot. Gard. **7:** 90, *pl. 21, f. 53.* 1927.

On soil along the road towards Monte Montoso, Maricao, *1077;* on moss and on fern roots on a hill between Aibonito and Cayey, *1975.* Type locality, near Maricao.

17. **Stigonema ramosissimum** Gardner, Mem. N. Y. Bot. Gard. **7:** 91, *pl. 21, f. 54.* 1927.

On rocks at Laguna Tortuguero, *852c;* on old palm wood at the Hacienda, Laguna Tortuguero, *870;* on red earth at Maricao, *1025a, 1247;* on rocks, between Ponce and Adjuntas, *1809.* Type locality, Laguna Tortuguero.

18. **Stigonema spiniferum** Gardner, Mem. N. Y. Bot. Gard. **7:** 91, *pl. 22, f. 56.* 1927.

On shaded earth near the "Campo," Maricao, *1229.* Type locality, Maricao.

19. **Stigonema scytonematoides** Gardner, Mem. N. Y. Bot. Gard. **7:** 92, *pl. 22, f. 57.* 1927.

On stone west of Humacao, *575, 577f;* on red earth near Mayaguez, *880e;* on rocks and on red earth by the road north of Maricao, *1245, 1247a, 1250, 1253a;* on rocks between Utuado and Adjuntas, *1643;* on rocks by the Arroyo de los Corchos, *1715.* Type locality, north of Maricao.

47. **HAPALOSIPHON** Naeg.; Kuetz. Sp. Alg. 894. 1849.

Type species, *Hapalosiphon Braunii* [= *H. fontinalis* (Ag.) Born.].

1. Filaments 6–7.8 $\mu$ diam.; trichomes 2.3–2.6 $\mu$ diam. . . . . 1. *H. tenuis.*
2. Filaments 10–14 $\mu$ diam.; trichomes 5–10 $\mu$ diam. . . . . 2. *H. subgelatinosus.*

1. **Hapalosiphon tenuis** Gardner, Mem. N. Y. Bot. Gard. **7:** 94, *pl. 23, f. 60.* 1927.

On serpentine rocks north of Sabana Grande, *943;* on bark in Utuado, *1496.* Type locality, near Sabana Grande.

2. **Hapalosiphon subgelatinosus** Gardner, Mem. N. Y. Bot. Gard. **7:** 94, *pl. 23, f. 61.* 1927.

On limestone between Arecibo and Utuado, *1476f.* Type locality, near Utuado.

48. **BRACHYTRICHIA** Zanardini, Phyc. Ind. Pug. 24. 1872.

Type species *Brachytrichia rivulariaeformis* (= *Nostoc Quoyi* Ag.)

1. **Brachytrichia Quoyi** (Ag.) Born. & Flah. Ann. Sci. Nat. Bot. VII, **4:** 373. 1886.

Growing on the roots of *Rhizophora* in the littoral belt, Culebra Island, *Howe, 4284;* Cayo Maria Langa, Bay of Guayanilla, *Howe, 7124;* on roots of *Rhizophora,* Cayo Don Luis, near Point Montalva, *Howe, 7185.* Type locality Marianna Island.

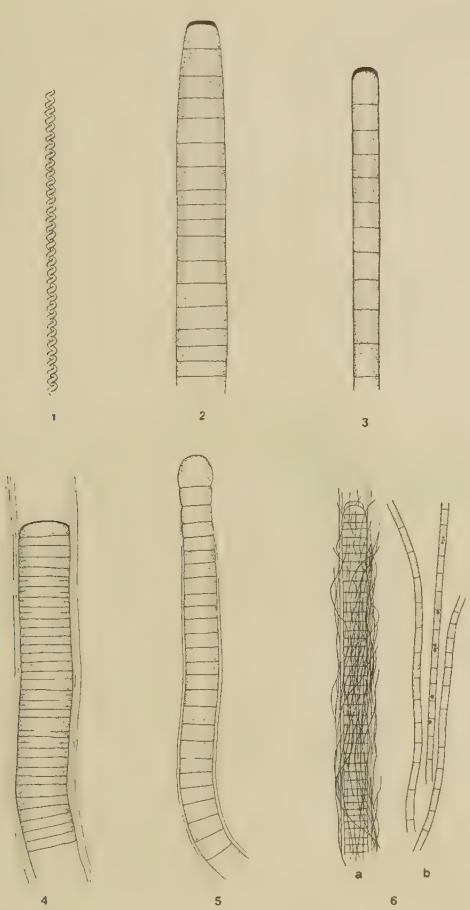
The combination *Brachytrichia Quoyi* was made by Bornet and Flahault (loc. cit.) based upon *Nostoc Quoyi* of C. A. Agardh, Syst. 22. 1824. The material was collected by Guadichaud on Marianna Island. In the same work (p. 372) they made the combination *Brachytrichia Balani*, based upon material named *Rivularia Balani* by Lloyd in 1860 (Algues de L'Ouest de la France, no. 303). Gomont (*in* Schmidt, Flora of Koh-Chang, Botan. Tidsskr. **24**: 210. 1901) published *Brachytrichia maculans*.

*Brachytrichia affinis* Setchell & Gardner was published in Univ. Calif. Publ. Bot. **6**: 475. 1918. The type locality for this species is Laguna Beach on the southern coast of California. Finally, Setchell (Univ. Calif. Publ. Bot. **12**: 66. 1926) published *Brachytrichia Codii* from the Island of Tahiti. These constitute all of the species of the genus known to the author.

Recently, in Rabenhorst's Krypt.-Flora (**14**: 554) Geitler has combined all of these species into one under the name *B. Balani* (Lloyd) Born. & Flah., citing exsiccatae material numbers 865, Wittr. Nordst. (*B. Balani*); 681, Hauck and Richter, Phyc. Univ.; and 8, Collins, Holden, and Setchell, Phyc. Bor. Amer. (the last 2 under *B. Quoyi*). The specimens distributed by Wittrock and Nordstedt are on barnacles and on *Codium* and do not form a definite thallus, on the latter the filaments extending in among the utricles. *B. Codii* likewise extends in among the utricles of the host. These two species are undoubtedly of close affinity, the distinction being in the shape, size, and arrangement of the cells. *B. Quoyi* and *B. affinis* also represent two closely allied species, both forming definite thalli, but these differing markedly in shape, size, and color, as well as in details of structure. *B. maculans* represents a form between these two groups with affinities more closely to the latter. I cannot agree with Geitler at present that all of these species should be combined into one entity. If further knowledge of their life histories under different conditions necessitates their combination, the name most appropriate would seem to be *Brachytrichia Quoyi*, since Agardh's specific name antedates all others. Such heroic treatment in combination, to be consistent, would certainly necessitate similar treatment of the species of other genera, e. g., *Nostoc*, in which the species are tied together by numerous overlapping characters.

## EXPLANATION OF PLATES 1 AND 2.

Figure 1. *Spirulina socialis*. A portion of typical filament. × 1100.
Figure 2. *Oscillatoria additicia*. Terminal portion of a typical mature filament. × 700.
Figure 3. *Oscillatoria maricola*. Terminal portion of a typical filament. × 700
Figure 4. *Lyngbya majuscula violacea*. Terminal portion of a typical mature filament. × 200.
Figure 5. *Lyngbya Baculum aeruginea*. Terminal portion of a typical mature filament with the trichome slightly protruding. × 700.
Figure 6. *Phormidium epiphyticum*. a. Filaments encircling the filaments of *Lyngbya aestuarii*. Diagrammatic. b. Portions of normal filaments. × 1300.
Figure 7. *Phormidium tenue marinum*. Portions of typical filaments. × 700.
Figure 8. *Phormidium angustissimum saxicola*. Portions of normal filaments. × 1500.
Figure 9. *Symploca Howei*. Three short filaments. × 700.
Figure 10. *Symploca paludicola*. Terminal portion of a single typical filament. × 700.
Figure 11. *Symploca Brittoniae*. Terminal portion of a filament with apical parts of three trichomes. × 500.
Figure 12. *Scytonema guyanense epiphyllum*. Typical filaments showing a variety of shapes of cells. × 250.

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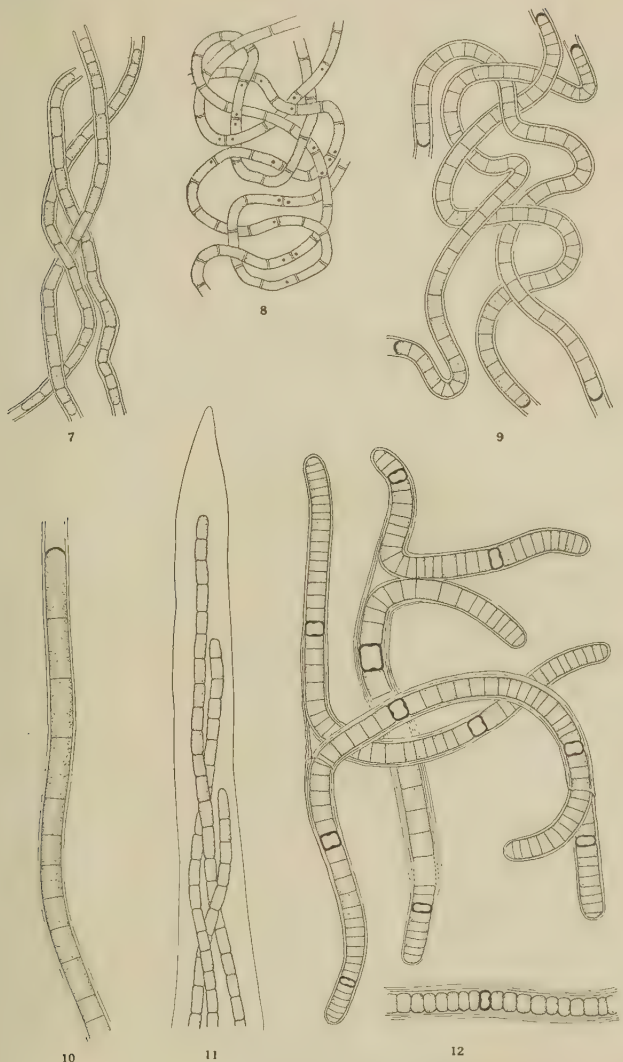


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